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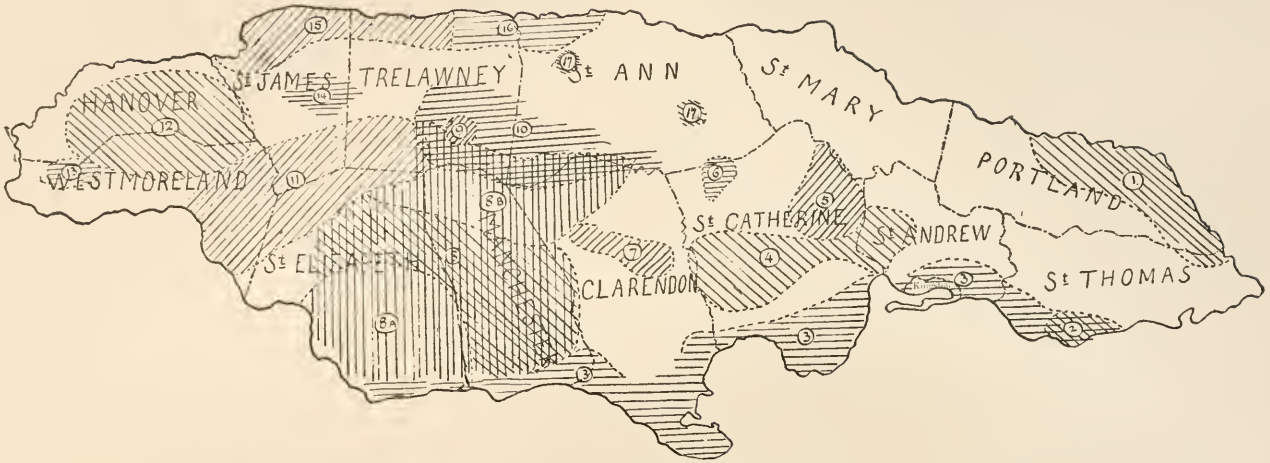

Compiled and drawn by P. W. Jarvis.

Map of Jamaica, illustrating distribution of Urocoptis (See pp. 114 to 142).

1 U. lata.
2 U. aspera.
3 U. brevis.
4 U. sanguinea.
5 U. nobilior.
6 U. transparens.
7 U. procera.
8 U. ambigua.
9 U. baquieana.
10 U. baquieana pudica.
11 U. cylindrus.
12 U. zonata.
13 U. megachila and amethystina.
14 U. dubia.
15 U. gravesi.
16 U. sanctæannæ.
17 U. instabilis.

SECOND SERIES: PULMONATA.

MANUAL

OF

CONCHOLOGY

STRUCTURAL AND SYSTEMATIC.

WITH ILLUSTRATIONS OF THE SPECIES.

FOUNDED BY

GEORGE W. TRYON, JR.

CONTINUED BY

HENRY A. PILSBRY, Sc. D.,

CONSERVATOR OF THE CONCHOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

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UROCOPTIDÆ.

PHILADELPHIA:

Published by the Conchological Section,

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

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A key to the genera and subordinate groups of *Urocoptidæ*, with a general discussion of the affinities and distribution of the family, will form the Introduction to Vol. XVI, the first two parts of which will contain monographs of the remaining genera, and an Index.

I am deeply indebted to Mr. John B. Henderson, Jr., of Washington, D. C., for the use of his very large series of Jamaican and Haitian *Urocoptidæ*, and to Mr. P. W. Jarvis, of Kingston, Jamaica, who supplied me with many specimens and valuable notes, and with maps showing the distribution of Jamaican species. Messrs. Sowerby and Fulton also have courteously supplied information upon particular species described by the former; and for still further information and specimens I have to thank my friends Dr. Wm. H. Dall, of the National Museum, and Mr. Geo. H. Clapp, of Pittsburg.

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ERRATA.

The reference to *plate 63*, on pages 110, 9th line from bottom; p. 111, 16th line from bottom; p. 201, 10th line from bottom, should read PLATE 43.

In place of the upper line on p. 143, read:

Section *Bactrocoptis* Pilsbry, 1902.

Pilsbry, Man. Conch. xv, pt. 58, p. 112, for *U. rosea montana.*

Reference to *Map no. 2*, on pp. 114 *et seq.,* should read Map no. 1.

On p. 205, fig. 25 should be deleted from the line under head of U. NOTATA.

On pp. 211, 232, reference should be made to the dentition of *U. garciana,* figured on pl. 43, f. 2; and on pp. 268, 270, to that of *U. gracillima,* figured on pl. 50, f. 11. In this species the radula is specialized less than in those mentioned on p. 268.

Genus EUCALODIUM Crosse & Fischer, 1868.

Urocoptis, section *a,* conico-turritæ, Albers, Die Heliceen edit. 2, p. 36 (1860).—*Eucalodium* Crosse & Fischer, Journ. de Conch. xvi, 1868, p. 88; Miss. Scientif. Mex., Moll. i. pp. 353-362.—Strebel & Pfeffer, Beitrag Mex. Land-und Süsswasser-Conchylien, iv, p. 62.—von Martens, Biologia Centrali-Americana, Moll., p. 254.

Shell cylindric or cylindric-tapering, the upper whorls always lost in adults, the hole closed by a somewhat convex partition, 7 to 14 whorls usually remaining; imperforate, the axis either straight or one-plaited, and solid or perforated by a mere chink. "Size comparatively large, between 84 and 32 mm. in length and 21 and 10 mm. in diameter." Surface covered with a thin cuticle, rib-striate or costulate. The last whorl becomes very shortly free in front. Aperture ovate, more or less angular above, the peristome free, thickened and narrowly reflexed.

The foot is rather short, the peduncle uniting it to the visceral mass comparatively long. There are two accessory neck-lobes. The kidney slightly exceeds the pericardium in length, and is wide at the base; the secondary ureter is apparently closed (pl. 49, fig. 17, *E. blandianum,* x 2; after Strebel).

The genital system (pl. 49, fig. 10, *E. ghiesbreghti* after Fischer; fig. 11, 12, 14, *E. blandianum* after Strebel) is simple. The penis is rather swollen, with longitudinally plicate internal wall (fig. 14) and a perforate septum at the apex, where the retractor and epiphallus are inserted. The long epiphallus is internally plicate below, but above the walls bear pyramidal warts (fig. 12). The retractor muscle of the penis is inserted in the lung floor. There is a moderately long vagina, and the globose spermatheca has a duct about as long as the uterus.

The free retractor muscles (pl. 49, fig. 16, *E. blandianum* after Strebel, diagrammatic,) are inserted high in the shell. The columellar muscle has the usual distal insertion in the posterior integument of the mantle, and gives off the other bands in the following order: 1, the pharyngeal retractor; 2, the retractor of the left side; 3, the right retractor. Each

tentacular band gives off a branch anteriorly, uniting in a plate over the buccal mass; from this plate the ocular retractors arise (pl. 49, fig. 13).

The jaw (pl. 50, fig. 1, *E. blandianum,* after Strebel) is of the usual arcuate shape, always has a slight median projection below, and is made up of many narrow vertical plates.

The radula in *E. ghiesbreghti* is wide, with the formula 65,1,65 x 110; the transverse rows being nearly straight. In all the other species examined it is narrower, with comparatively few teeth: 36,1,36 x 130 in *E. blandianum* (Fischer), 34,1,34 x 130 (Strebel for the same species); 24,1,24 in *mexicanum;* 31,1,31 in *E. edwardsianum,* 26,1,26 in *E. martensi* (Strebel). The teeth are similar in all, being of the type common to most ground-living *Helicidæ.* The rhachidian tooth is tricuspid, the mesocone conic, a little over-reaching the posterior border of the basal-plate. The lateral teeth are similar except for the suppression of the entocones. Marginals also biscupid, the ectocone sometimes split (pl. 50, fig. 2, 3, *E. blandianum,* after Fischer).

The intestinal tract (pl. 49, fig. 15. *E. ghiesbreghti* after Fischer) should be refigured with the parts in their natural positions, in order to compare with other genera. The salivary glands are large and united. The fore-gut is very long, as in other genera of this family. The stomach is thin-walled.

"Geographically limited to the southern half of Mexico and the northern half of Guatemala." They live on the ground under dead leaves, chiefly in moist woods, and in dry seasons bury themselves in the earth.

The most striking single character of *Eucalodium* is perhaps the union of the ocular retractor muscles in a plate lying over the gullet. The rest of the soft anatomy, so far as known, does not differ remarkably from that of allied genera.

Subgenera.

Eucalodium s. str.: Axis carrying a strong, compressed, spiral lamella, median in each whorl.

Oligostylus: Axis simple and straight, or slightly curved spirally.

Subgenus EUCALODIUM s. str.

In this group the internal pillar is flattened and strongly twisted to form a spirally ascending plate or lamella (pl. 5, f. 20; pl. 7, f. 2, 12). The columella is more or less abruptly truncate obliquely at the base, as seen in an oblique view. Usually a careful inspection of that portion of the axis exposed by the truncation of the summit will show the form of the pillar (see pl. 8, fig. 17); but it is better to expose it by cutting a hole in the shell. Only three or four species of the restricted subgenus are known. In all of them the cuticle is thin and generally lost in adult shells.

I. Solid, strong-shelled species.
   1. Very large, length 70 to over 80 mm., with sculpture of coarse, low, waved wrinkles; pale brown or dark red-brown.
      E. decollatum, and var. *ghiesbreghti.*
   2. Smaller, length 52 mm., with close, low rib-striæ; white. *E. compactum.*

II. Rather thin, weakly wrinkle-striate, flesh-colored or fleshy-brown; length 32-55 mm. *E. mexicanum.*

E. DECOLLATUM (Nyst). Pl. 4, fig. 9 (type figure); pl. 1, fig. 1.

Shell thick, pale ashen, turreted-cylindric, the apex truncate, base subumbilicate; whorls a little convex, striate; aperture suborbicular; columella one-folded; lip reflexed.

It is cylindrical, turriculate, the shell though thick is subdiaphanous. The spire is formed of 10 narrow, slightly convex whorls, covered with longitudinal, slightly oblique striæ, more pronounced near the sutures, which are simple and not deep. The summit of the spire is truncate, as in *Bulimus decollatus.* The last whorl is very short, convex beneath, and pierced by an umbilical chink which is not deep and is wholly closed. The aperture is large, orbicular, detached from the rest of the shell, and is a little oblique to the axis. Columella provided with a fold in the middle, comparable with that of the Clausilias. The color of the shell is ashen-brown. The apertural side of the shell is much worn. Length 75, diam. 20 mm.

State of Tabasco, southeastern Mexico. (Ghiesbreght.)

Pupa decollata Nyst, Bull de l'Acad. Roy. des Sci. et Belles-Lettres de Bruxelles, viii, 1841, p. 344, upper fig. of plate.—Not *Eucalodium decollatum* Nyst, Crosse & Fisch., Moll. Mex. p. 363, pl. 14, f. 3, 3a, *Cylindrella decollata* Pfr., Monogr. viii. p. 427.—v. Mart., Biol., p. 260.

I have copied Nyst's figure and the substance of his description. These indicate a species much like *E. ghiesbreghti.* I am wholly disposed to consider that the long-lost species of Nyst was based upon a pale and weather-bleached specimen of that well-known species. The strong fold of the columella, shown in Nyst's figure, shows that *decollata* was a member of the typical section of *Eucalodium,* having a cork-screw shaped axis; and the number of whorls, solidity, size, etc., indicate the correctness of my conclusion. I have figured (pl. 1, fig. 1) a shell agreeing with *ghiesbreghti* in everything but color. It is very pale brown or isabella-tinted, with slightly over 9 whorls, and measuring, length 70, diam. 20½ mm. This shell seems to me to practically fulfill the requirements of Nyst's description.

Crosse and Fischer have identified as *decollata* a much smaller shell, length 60, diam. 16½ mm. (pl. 4, fig. 8), from Vera Paz, in northern Guatemala, collected by Morelet. Although their result was worked out with great care, it seems to me erroneous. The finding of nearly white specimens of *E. ghiesbreghti* gives us a shell in agreement with the original description of *decollata,* and from the same locality; the original specimen of *decollatum* having been obtained by Ghiesbreght in the state of Tabasco, southeastern Mexico.

Var. *ghiesbreghti* (Pfeiffer). Pl. 5, figs. 18, 19, 20, 21.

Shell arcuate-rimate, cylindric-turreted, truncate, solid, blackish brown; spire tapering, broadly truncate; 10-11 whorls remaining, a trifle convex, the upper ones closely striate, lower lightly sculptured with waved folds; last whorl free in front, striate, angulate above, obtusely carinate below the middle. Aperture oblique, subangulate-oval, the base somewhat effuse, with a strong compressed fold twisting around the columella; peristome continuous, flexuous, whitish, nar-

rowly reflexed throughout. Length 82, diam. 22 mm.; aperture with perist. 21 mm. long, 15 wide (Pfr.).

Chiapas, in S. E. Mexico, type locality. (Ghiesbreght). *Vera Paz* (Bocourt) and *Coban* (Salvin), in N. Guatemala.

Cylindrella ghiesbreghti Pfr., P. Z. S. 1856, p. 380, pl. 36, f. 1; Malak. Bl. 1856, p. 215; Conchyl. Cab. p. 33, pl. 8, f. 18, 19; Monogr. iv. 694; vi, 364; viii, 426.—Tristram, P. Z. S. 1861, p. 231.—Sowerby, Conch. Icon. xx, pl. 1, f. 7.—*Eucalodium ghiesbreghti* Pfr., Crosse & Fischer, Journ. de Conchyl. 1868, p. 88; 1870, p. 13, pl. 5, f. 1-4 (jaw and teeth). Moll. Mex. p. 368, pl. 14, f. 4, 4*a* (shell) and pl. 16, f. 14-21 (anatomy). —Strebel, Beitr. Mex. Land-und Süssw.-Conch., iv. p. 63, pl. 5, f. 20; pl. 14, f. 11 *a, b.;* with form B, p. 64, pl. 7, f. 4.—Martens, Biol. Centr.-Amer., Moll., p. 255.

The dark reddish-chocolate color (fading above and on the base and whitish around the mouth), the low, spaced, waved and anastomosing wrinkles of the surface, and the decidedly tapering contour, are characteristic. The number of whorls remaining varies from 9 to over 13. It is very solid and strong, with a strongly angular columella, and a strong spiral lamella on the internal pillar (fig. 20). I retain the form varietally separate from *E. decollatum* merely on account of its long standing in the literature, as it differs from that only in color. Fig. 21 is from one of Pfeiffer's types, after Strebel, Fig. 19 from a typical specimen in coll. A. N. S. P., with 10½ whorls. Fig. 18 from Crosse & Fischer. Neither of these figures is turned to show the strongly angular columella.

One specimen before me (fig. 22) is isabella-tinted, paler above, white behind the lip and the base. It has the form and sculpture of the dark typical form, and a trifle over 9 whorls remain. It is referable to typical *E. decollatum.*

E. compactum Pilsbry. Pl. 7, figs. 1, 2, 3.

Shell cylindric-tapering, solid, having a short, deep, closed umbilical chink; the cuticle thin (deciduous?) very pale straw-colored; composed of 8½ narrow, somewhat convex whorls, which are rather strongly striate, the striæ arcuate, from one-half to one-third of a mm. apart except on the last

whorl where they stand closer; last whorl becoming very shortly free in front, distinctly angular at the periphery on the front of the whorl, but soon becoming evenly rounded, the usual peripheral cord being reduced to a mere trace on the latter part of the whorl. Aperture oblique, irregularly ovate, the outer and basal margins regularly arcuate, inner margin straightened; peristome continuous, free, expanded and reflexed. Columella vertical, obsoletely truncate below. Internal axis twisted to form a strong spiral lamella with obsoletely crenate edge. Length 52, diam. 17 mm.

Tabasco, southeastern Mexico (Rovirosa).

E. compactum Pils., Proc. Acad. Nat. Sci. Phila. 1892, p. 338, pl. 14, f. 4, (Jan. 24, 1893).—v. Mart. Biol. Centr.-Amer., Moll., p. 260.

Related to *E. ghiesbreghti,* but smaller, with different sculpture and unlike in the shape of the aperture. It differs from *E. mexicanum* by the great solidity of the shell, which is thick, like *ghiesbreghti,* the distinct and regular striation, and the shortness of the whorls. It is also a broader shell, with conspicuously flaring outer lip.

The color of the two shells known is grayish-white, one of them retaining small traces of an extremely thin pale yellow cuticle. There is none of the reddish hue of the allied species. The whorls are unusually narrow. In the type specimen the spiral lamella of the axis is less broadly projecting and less acute than in the younger shell drawn in fig. 2. Its edge is crenulated. The diameter of the shell given in my original description included the lip, and hence does not agree with the dimensions given above; both descriptions applying to the same individual.

E. mexicanum (' Cuming ' Pfr.). Pl. 7, figs. 8, 9, 10; pl. 1, figs. 2, 3.

Shell sulcate, rimate, turreted, lightly arcuate-striate and under a lens punctulate, but little shining; violaceous-brown; suture light, somewhat whitish. Whorls remaining 10, rather flat, the last obtusely angular below the middle, produced forward, carinate above. Columella provided with a denti-

form, compressed fold. Aperture slightly oblique, irregularly oval, angular above; peristome continuous, reflexed throughout, the right margin thickened, regularly arcuate, left margin sinuous. Length 55, diam. 15, length of aperture 13, width 10½ mm. (Pfr.).

Mexico (Cuming); *Tabasco* (Berendt); *Chiapas* (Bland).

Cylindrella mexicana ' Cuming,' Pfr., P. Z. S. 1860, p. 139; Mal. Bl. viii, 1861, p. 80; Monogr. vi, p. 364 (with var. *minor*); Novit. Conch. iii. p. 435, pl. 97, f. 16, 17 (var. *minor*).—*Eucalodium mexicanum* Cum., Crosse & Fischer, Journ. de Conchyl. 1868, p. 88; Moll. Mex. i, p. 369, with var. *minor* and *major*.—Strebel, Beiträge iv, p. 62, pl. 6, f. 7; pl. 11, f. 3 (radula), 11 (jaw), 16 (anat.); and var. *minor*, p. 63, pl. 5, f. 11.

The original description is given above. The specimens before me are *rather thin*, flesh-colored under a very thin, pellucid cuticle, which has been lost from most of the specimens, but when perfectly preserved gives the shell a gray-brown color, with pink more or less obviously showing through. The sculpture is of irregular, slightly oblique and weakly arcuate growth-wrinkles, the early whorls more regularly though weakly costulate. The base is angular in front, the carina varying in strength and persistence. The last whorl is shortly free, the length of the free portion varying a good deal, and there is also wide variation in the shape of the aperture. Peristome white, narrowly reflexed. The columella is markedly bent or excavated below. The internal column (pl. 7, fig. 12) is a flattened spiral, with the edge more or less roughened by little projections, more widely spaced than in *E. compactum*. With age the spiral becomes less acute and the projections tend to disappear.

Length 46, diam. 13½ mm.; no. of whorls 8⅓.

Length 50, diam. 13½ mm.; no. of whorls 9¾; form more tapering.

Length 49, diam. 13½ mm.; no. of whorls 8½.

The fine sculpture (" sub lente punctulata ") of Pfeiffer's type was obviously due to the condition of the slightly eroded surface. The summit, with its granulose plug and the sigmoid axial pillar, are shown in fig. 17 of pl. 8.

Var. MAJOR C. & F. Larger, more violaceous; whorls remaining 10½; length 67, diam. 16 mm. Alta Vera Paz (Bocourt); woods between Tactic and Tamahu (Sarg), Guatemala.

I have not seen this large southeastern race, which approaches *E. ghiesbreghti* in size.

Var. MINOR Pfr. Pl. 7, figs. 11, 12, 13, 14.

Shell much smaller, thinner, with the same sculpture and color.

Length 32½, diam. 10 mm.; whorls 8. (Pfeiffer's type).
Length 33½, diam. 11 mm.; whorls 7½. Figs. 11, 12).
Length 36⅓, diam. 9⅔ mm.; whorls 8¾.

The basal angulation is represented too strong in fig. 11. The localities Alta Vera Paz (Bocourt) and woods between Tactic and Tamahu (Sarg), both in Guatemala, and Juquila, state of Oaxaca, Mexico, are given for this race. The specimens before me are labeled merely Mexico.

Subgenus OLIGOSTYLUS Pilsbry, Dall, 1895.

Oligostylus Pilsbry, in DALL, Nautilus ix, p. 51 (Sept. 1895), type *E. blandianum.*

The internal pillar is slender and either straight or slightly sigmoid within each whorl, never flattened into a spiral lamella. Externally the shell does not differ in any conspicuous respect from typical *Eucalodium.* The typical species, *E. blandianum,* has a narrower radula (teeth 36.1.36) than typical *Eucalodium.*

This group includes most of the species of the genus. They are in many cases closely related and difficult to distinguish.

1. Large solid species, length 70 mm. or more, *group of E. blandianum.*
2. Smaller species, length less than 60 mm., in which the last whorl is but shortly built out in front, the rib-sculpture is moderately coarse, and the internal axis is slightly sigmoid, *group of E. splendidum.*
3. Thin, somewhat fusiform, densely rib-striate species, in which the last whorl deviates and descends considerably in front, and the aperture is very oblique; axis is straight and slender, *group of E. speciosum.*

Group of E. blandianum.

E. BLANDIANUM Crosse & Fischer. Pl. 5, figs. 23, 24, 25, 26; pl. 8, fig. 21.

Shell imperforate, arcuate-rimate, cylindric-tapering, solid; olive, *the striæ and short transverse wrinkles yellow.* Surface somewhat glossy, strongly striate obliquely, the striæ much narrower than the intervals, slightly arcuate, conspicuous by their yellow color; the intervals more or less malleate. Whorls gradually tapering to the broadly truncate apex, 8 being retained in the adult shell; the last whorl convex, the base smoother, defined by a slight narrow carina, scarcely modifying the general convexity except in front. The whorl becomes very shortly free in front. Aperture *quite oblique,* angularly oval; peristome white, obtuse, narrowly reflexed throughout; columella gently spiral, *not truncate or angular.* Internal axis (pl. 5, fig. 26) *slender and nearly straight.* Length 78, diam. above aperture 20 mm.

Eastern Mexico: *Mountains near Orizaba* (type locality; Sallé, Bland, Botteri); *rocky country near San Juan Miahuatlan, between Jalapa and Misantla,* on moist ground among moss and herbs (Doña Estefania); *Coatepec* (Höge).

Eucalodium blandianum C. & F., Journ. de Conchyl. xvi, 1868, p. 276; 1870, p. 22; Moll. Terr. Mex., p. 374, pl. 14, f. 5, 5*a* (shell), pl. 16, f. 11-13 (radula).—STREBEL, Beitr. Mex. iv, p. 65, pl. 7, f. 2*a-k*, 5; pl. 14, f. 10 *a, b;* pl. 11, f. 4, 5, 12; pl. 12, f. 2 *a-o* (anatomy).—MARTENS Biol. Centr. Amer., Moll., p. 258.—*Cylindrella blandiana* PFR., Monogr. viii, p. 136.—*Cylindrella speciosa* Dkr., SOWERBY, Conch. Icon. xx, pl. 1, f. 2.—*E. blandianum* var. *B,* C. & F., J. de C. 1878, p. 251; 1879, p. 48; Miss. Scient. Moll. ii, p. 665, pl. 72, f. 2, 2*a*. —*E. b.* var. *minor* C. & F., MARTENS, Biol. p. 633.

Somewhat glossy, yellowish-olive or more or less suffused with brown, generally with the striæ and wrinkles yellow, and with some darker oblique streaks. The surface is malleated in places, either in the interstices or involving the striæ. Figures 24, 25 are from Crosse and Fischer's type figures, agreeing with specimens before me from Bland. Figs. 23, 26 are copied from Strebel's illustration of his form B, from

near San Juan Miahuatlan. Fig. 21 of pl. 8 represents the sculpture of a specimenfrom Orizaba, magnified 5 diameters. In some shells the irregular malleation and the subsutural wrinkling are much less developed.

Var. *minor* 'C. & F.,' Martens. Smaller than the typical form, and the malleation of the shell is less distinct and less rough; whorls 8½, the last abruptly descending, and produced forward more than in the typical form. Length 65, diam. 16½, length of the aperture with peristome 14, width 12 mm. (C. & F.)

The part of the *Mission Scientifique au Mexique* in which this form is figured, is still unpublished, though quoted by Prof. v. Martens.

E. SUMICHRASTI CROSSE & FISCHER. Pl. 1, figs, 10, 11.

Shell slightly arcuate-subrimate, cylindric-turreted, rather thick, solid; violaceous-brown under a shining, thin, rather deciduous olivaceous cuticle. Spire a little tapering, widely truncate; suture impressed. 8 whorls remaining are a trifle convex, rather narrow, regularly increasing, sculptured with numerous delicate, close, subarcuate, but slightly projecting riblets, the penultimate whorl slightly malleate, last whorl slightly descending, shortly free, slightly protracted forward, subangular above, having a slight obtuse keel below the middle. Aperture oblique, irregularly angulate-circular, the base somewhat effuse, interior white; peristome continuous, free, thickened, narrowly reflexed throughout, white; columella deeply situated, hardly folded. Internal axis unknown. (C. & F.)

Length 61, diam. 18 mm.; apert. with perist. 14½ mm. long, 13 wide.

Length 66, diam. 19 mm.; apert. with perist. 15 mm. long, 13 wide.

Southern Mexico: *State of Chiapas* (F. Sumichrast).

Eucalodium sumichrasti C. & F., Journ. de Conchyl. xxvi, p. 250 (1878); xxvii, p. 46, pl. 2, f. 2 (1879); Miss. Scient. Mex., Moll. ii, p. 665, pl. 72, f. 1, 1*a*.—MARTENS, Biologia, Moll., p. 633.

E. sumichrasti seems to be intermediate between *E. blandianum* and *E. decollatum* Nyst, of which *E. ghiesbreghti* is very likely a synonym. It is distinguished from *E. blandianum* by the less tapering spire, flatter whorls, less visible and weaker malleation of the shell, which at the same time is more solid; the costulæ are finer, more numerous and filiform; the aperture is angularly rounded and milk white, the peristome is pure white and not whitish, and finally, the columellar margin is wholly without a fold. It differs from *E. decollatum* by the olive-green cuticle, distinct malleation of the last two whorls, finer costulation and less irregular aperture (C. & F.).

E. WALPOLEANUM Crosse & Fischer. Pl. 4, figs. 1, 2, 3, 4; pl. 8, fig. 22.

Shell imperforate, arcuately rimate, cylindric-tapering, moderately solid, brownish-yellow with indistinct darker streaks or reddish-brown. Surface somewhat glossy, sculptured with regular thread-like striæ separated by much wider intervals, which are *closely and finely wrinkle-striate spirally,* the spirals sometimes passing over the striæ also. The spire tapers above, but several later whorls are of about equal diameter; apex truncate. Whorls remaining about 10 (9 to 12), convex, the last having the base defined by a small carina; shortly free in front, aperture somewhat oblique, ovate, angular above, white or reddish inside. Peristome white, continuous, narrowly reflexed throughout. Columella oblique, a little excavated below. Internal column slender, a little sinuous. Length 75, diam. 18 mm.

Southeastern Mexico: *Woods of Palenque,* Chiapas (type locality, Morelet); *Chiapas* (Boucard). Northern Guatemala: *Mountains of Vera Paz* (Bocourt); *Coban* (Salvin); *woods between Tactic and Tamahu* (Sarg.).

Eucalodium walpoleanum C. & F., Journ. de Conchyl. 1872, p. 75; Moll. Mex. i, p. 377, pl. 14, f. 6, 6*a*.—v. Mart., P. Z. S. 1875, p. 648; Biol. Centr. Amer., Moll., p. 259. — STREBEL Beitrag, iv, p. 67, pl. 7, f. 1 a, b; pl. 14, f. 12.—*Cylindrella walpolei* SOWB., Conch. Icon. xx, pl. 6, f. 51. — *Cylindrella*

walpoleana Pfr., Monogr. viii, p. 427.—?*Cylindrella decollata* Nyst, Pfr. in Philippi, Abbild. ii, p. 47, pl. 2, f. 1.—Monogr. i, p. 368; Conchyl. Cab. p. 33, pl. 1, f. 2.

" Very near *E. blandianum,* resembling it in size and color, but somewhat more slender, and often of a darker brown tint. The chief difference however, is in the sculpture," *E. walpoleanum* having more numerous and narrower, thread-like riblets, their intervals being closely crinkled with spiral striæ (pl. 8, fig. 22). The basal angle also is more pronounced. The internal column is slender and weakly curved in a spiral, though usually less so than is shown in fig. 3.

Strebel has defined a small form, somewhat intermediate between *E. walpoleanum* and *E. blandianum,* as form B (pl. 4, fig. 5). In color and gloss it resembles *E. blandianum,* but has the sculpture of *E. walpoleanum,* the riblets standing as close as in that species, though somewhat stronger. On the penultimate whorl (16¾ mm. wide) there are about 100 riblets, while in an especially small example of *blandianum* with the penult. whorl 17 mm. wide, there are only about 65 riblets. The internal pillar is like that of *E. blandianum.* This form is from Cuatitlan and San Juan Miahuatlan.

E. insigne Crosse & Fischer. Pl. 4, figs. 6, 7.

Shell arcuate-rimate, cylindric-turreted, solid, hardly shining, livid ashen-flesh colored. Spire perceptibly tapering, broadly truncate; suture impressed; 10 remaining whorls a trifle convex, regularly and subobliquely costulate, the last slightly descending, shortly free in front, subangular above, the base regularly rib-striate, having an inconspicuous thread-like keel below the middle. Aperture slightly oblique, subangularly ovate, whitish inside; peristome continuous, thickened, shortly reflexed throughout, whitish, the columellar margin slightly subplicate within. Internal axis unknown. Length 74, diam. 18 mm. (*C. & F.*).

Southern Mexico (Ghiesbreght).

E. insigne C. & F., Journ. de Conchyl. 1872, p. 301; Moll. Mex. i, p. 366, pl. 14, f. 7, 7*a*. — v. Mart., Biologia Centr.-Amer., Moll., p. 259. — *Cylindrella insignis* C. &. F., Pfr., Monogr, viii, p. 428.

Differs from *E. walpoleanum* in sculpture and form of the aperture. It is more slender than the closely related *E. ghiesbreghti,* and paler in color. From the form of the columella, it probably has a straight and simple internal pillar.

Group of E. splendidum.

E. GRANDE (Pfeiffer). Pl. 6, figs. 30, 31, 32, 36, 37; pl. 8, fig. 20.

Shell deeply rimate, turreted, broadly truncate, rather solid, obliquely hair-striate, the interstices seen under a lens to be obliquely striatulate, a little shining, brownish-ruddy. Suture white-margined. 8 whorls remaining, a little convex, the last obtusely carinate at the base, slightly protracted forward; columella subplicate. Aperture slightly oblique, oval, subangular above; peristome continuous, narrowly expanded, slightly reflexed. Length 56, diam. 17 mm.; aperture 13½ mm. long, 10 wide (*Pfr.*).

Juquila, Oaxaca, in south-central Mexico (Boucard).

Cylindrella grandis PFR., P. Z. S. 1860, p. 139, pl. 50, f. 3; Malak. Bl. viii, 1861, p. 80; Monogr. vi, p. 364; Novit. Conch. iii, p. 455, pl. 100, f. 8, 9.—SOWB., Conch. Icon. xx, pl. 1, f. 4. —*Eucalodium grande* Pfr., CROSSE & FISCHER Moll. Mex., i, p. 371, pl. 15, f. 4.—STREBEL, Beitr., iv, p. 68, pl. 5, f. 19.—v. MARTENS, Biologia, Moll., p. 261.—*Eucalodium gracile* PAETEL, Catal., p. 102.

The number of whorls varies from 7½ to 8⅞, the length from 52 to 60 mm. The sculpture according to Strebel, who examined one of Pfeiffer's specimens, consists of fine, rather weak, pretty closely crowded and only weakly arcuate riblets, about 126 on the penult. whorl. They are not very regularly arranged, and often are rib-like folds rather than ribs. On the upper whorls they are sharper and more spaced, and as usual they are more crowded near the aperture, coarser, and fold-like. In the intervals, on the upper third of the whorls, there are distinct, fine, sharp little folds, running obliquely forward, showing also below on the last 3 whorls. The internal pillar is like that of *E. walpoleanum,* but perhaps more sharply twisted around the axis. Aperture, peristome, col-

umellar fold and umbilical chink show no especial differences from *E. walpolcanum,* to which *E. grandis* is closely related. The riblets are closer and weaker than in *E. blandianum.*

E. SPLENDIDUM (Pfeiffer). Pl. 6, figs. 33, 34, 35, 38, 39; pl. 8, figs. 19, 23.

Shell rimate, turreted, broadly truncate, rather solid, with oblique hair-like riblets, a little glossy, fleshy-violaceous; suture with a white hair-line, crenulated. 8 to 8½ whorls remaining, moderately convex, the last with a very obsolete thread-like carina, shortly free in front. Columella subplicate. Aperture nearly vertical, obliquely oval; peristome continuous, white, narrowly reflexed, subangular above. Length 46, diam. 15 mm.; apert. with perist. 12 mm. long, 10 wide. (*Pfr.*).

Zacatepec, State of Oaxaca, in south-central Mexico (Boucard).

Cylindrella splendida PFR., P. Z. S. 1860, p. 139, pl. 50, f. 1; Malak. Bl. viii, 1861, p. 80; Monogr. vi, p. 377; Novit. Conch., p. 432, pl. 97, f. 1, 2.—SOWERBY, Conch. Icon. xx. pl. 1, f. 3. — *Eucalodium splendidum* CROSSE & FISCHER, Moll. Mex., i, p. 372, pl. 15, f. 3, 3*a*.—STREBEL, Beitr. iv, p. 69, pl. 5, f. 17.—von MARTENS, Biol. Centr. Amer. Moll., p. 261.

The figures given by Pfeiffer (pl. 6, fig. 34), Sowerby and Strebel represent the shell as more inflated than *E. grande,* from which it differs chiefly in the much more widely spaced striation. The figures of Crosse and Fischer resemble the specimen before me, which is probably one of the original lot (pl. 6, fig. 35). The axis is noticeably sigmoid within each whorl, and is moderately stout. It is hollow, showing a minute, acutely ovate orifice at the apical truncation (pl. 8, fig. 23). The narrow, acute riblets of the surface are far more widely spaced than in *E. grandis,* and as in that species, a very minute sculpture of vertical wrinkles not parallel with the riblets, may be seen in the intervals, chiefly below the sutures (pl. 8, fig. 19).

E. DECURTATUM (H. Adams). Pl. 6, figs. 27, 28, 29; pl. 1, fig. 5; pl. 8, figs. 15, 16.

Shell arcuate-rimate, subcylindric, truncate, rather thin, lightly plicate obliquely, pale rufous-tawny. Suture impressed. Whorls remaining 6 to 7, rather flattened, a little angulate above, the last shortly free in front, not descending, very lightly thread-carinate above and at the base. Aperture a little oblique, subcircular; peristome narrowly expanded and a little reflexed, whitish. Length 28 to 29, diam. 10 mm.; diam. of apert. 6 mm. (*H. Ad.*).

Putla, State of Oaxaca, Mexico (Boucard).

Cylindrella (*Urocoptis*) *decurtata* H. AD., P. Z. S. 1872, p. 13, pl. 3, f. 20.—PFR., Monogr. viii, p. 439.—*Eucalodium decurtatum* H. Ad., CROSSE & FISCHER, Moll. Mex., p. 385, pl. 15, f. 5, 5*a*.—v. MART., Biol. Centr.-Amer., Moll., p. 261.

The original description is given above, and the original figure copied, pl. 6, fig. 27. The single specimen before me (pl. 1, fig. 5, and pl. 8, figs. 15, 16) is flesh-pink with some whitish over-color in streaks and diffused. Whorls 6½, the first one sculptured with delicate, regular, wide-spaced riblets. These become lower and less distinct on the subsequent whorls, and much closer, crowded, on the last. The internal pillar is slender and nearly straight, showing only a very slight twist, less than in *E. grande* or *E. splendidum.* It measures, length 29½, diam. 9½ mm., being much smaller than either of the species mentioned.

E. HIPPOCASTANEUM Dall. Pl. 1, figs. 6, 7, 8, 9.

Shell rimate, cylindric, somewhat tapering above, rather thin; dark chestnut brown, becoming bright brownish-yellow behind the outer lip. Surface somewhat glossy, regularly rib-striate, the riblets oblique, arcuate, narrower than their intervals, somewhat stronger and more spaced on the earlier whorls, becoming closely crowded on the last whorl; the intervals are puckered by fine vertical wrinkles below the suture, obsolete in places; and the convexity of the last two whorls is irregularly malleated, interrupting the riblets more or less. Suture impressed, marked by a fine yellow line. Whorls 6½,

evenly convex, the last having the base defined by a low cord. Aperture oblique, nearly round, slightly angular above, purplish within with a white lip-border. Peristome continuous, very shortly free above, obtuse, hardly expanded. Columella oblique. Internal axis slender, slightly sinuous.

Length 28½, diam. 10; length of aperture 8, width 7 mm. Length 32, diam. 9.2, apert. 8 mm.

San Sebastian, Jalisco, Mexico (E. W. Nelson).

E. hippocastaneum Dall, Nautilus xi, p. 61 (October, 1897). —v. Martens, Biologia, Moll., p. 633.

Close to *E. decurtatum,* from which it differs in the dark color and the stronger riblets of the later whorls. In other respects the two species are alike. The type specimen has 8 whorls and is 32 mm. long; that here figured, one of the type lot, is smaller with scarcely 6½ whorls remaining.

E. recticosta (Pfeiffer). Pl. 3, figs 21, 22, 23.

Shell rimate, subcylindrical, attenuated towards the truncated apex, solid, whitish. Whorls 8, narrow, longitudinally and closely ribbed, the ribs straight; the penultimate whorl obtusely angulate above the suture, the last whorl at the periphery, nearly smooth below the angle, not produced forward. Aperture subvertical, obliquely oval; peristome nearly simple, very narrowly expanded, appressed above. Length 36, diam. 12 mm.; width of the middle whorl scarcely 5 mm. (*Pfr.*).

Culata, near Manzanillo, State of Colima (W. Lloyd); *Oaxaca* (Sowerby); *Southeastern Mexico* (Ghiesbreght).

Cylindrella recticosta Pfr. in Philippi's Abbild. u. Beschreib., ii, p. 48, pl. 2, f. 3 (1847); Monogr. ii, p. 369; Conchyl. Cab. p. 8, pl. 1, f. 21, 22.—Sowerby, Conch. Icon. xx. pl. 13, f. 119.—*Eucalodium recticosta* Crosse & Fischer, Moll. Mex., i, p. 386, pl. 14, f. 12, 12 *a. b.*—v. Mart., Biol. p. 265.

Distinguished by its strong sculpture and white color. The aperture is nearly circular, as broad as long. The internal pillar is unknown.

E. moussonianum Crosse & Fischer. Pl. 3, figs. 15, 16, 17, 18.

Shell slightly arcuate-subrimate, cylindric-turreted, rather

solid; white under a pale olive-tawny cuticle, streaked here and there with darker, and but little deciduous, glossy. Spire moderately tapering, broadly truncate; suture impressed. Whorls remaining 7, slightly convex, rather narrow; ornamented with slightly arcuate, subobliquely longitudinal riblets, which are somewhat irregular, peculiarly wrinkle-malleate, and the color of the rest of the surface. Last whorl a little descending, shortly free, slightly produced forward, a trifle subangular above, with a slight inconspicuous, thread-like carina below the middle. Aperture a little oblique, subangulate-rounded, white inside; peristome continuous, thickened, narrowly reflexed throughout, white, the columellar margin hardly plicate within. Length 44, diam. 14 mm.; aperture with peristome 10½ mm. long, 10 wide (*C. & F.*)

Mexico (Sallé).

Cylindrella decollata var. B, Pfr., Monogr. ii, p. 368.—*C. speciosa* Dkr., Pfr., Malak. Blätt. iii, p. 216 (1856); Monogr. iv, p. 695; Conchyl. Cab. p. 34, pl. 1, f. 3, 4.—*Eucalodium moussonianum* Crosse & Fisch., Journ. de Conch. xx, p. 225 (1872); Moll. Mex. i, p. 375, pl. 14, f. 11, 11*a*. — Strebel, Beitr. iv, p. 67, pl. 5, f. 16; pl. 13, f. 14.—v. Mart., Biologia, p. 263.—*E. boucardi* var. *d*, Cr. & Fisch., Moll. Mex., p. 381.

"Agrees in its malleated sculpture, as well as in color, with *E. blandianum*," but is much smaller, with shorter whorls and rounded aperture. According to Strebel the internal pillar is exactly like that of *E. blandianum*.

E. neglectum Crosse & Fischer. Pl. 3, figs. 19, 20.

Shell arcuate-rimate, cylindric-turreted, solid, little shining, pale ashy-brown. Spire suddenly attenuated above, rather broadly truncate, the suture impressed. Whorls remaining 9, a little convex, subobliquely rib-striate, the first 2 attenuated, those following somewhat inflated, the last slightly descending, shortly free, very obtusely subangular above, inconspicuously thread-carinate below the middle. Columella inconspicuously subplicate. Aperture slightly oblique, subangulate rounded, dirty white inside; peristome continuous, somewhat thickened, narrowly reflexed throughout, whitish.

Length 38, diam. 11 mm.; aperture with peristome 8½ mm. long, 8 wide (*C. & F.*).

Oaxaca, central Mexico (Boucard).

E. neglectum C. &. F., Journ. de Conch. xx, p. 302, 1872; Moll. Mex. i, p. 373, pl. 14, f. 8, 8*a*.—Strebel, Beitr. iv, p. 67, pl. 13, f. 15.—v. Mart., Biol., pp. 263.

Distinct by its small aperture and narrow whorls. I have not seen specimens.

E. martensi Strebel. Pl. 3, figs. 24-33.

"Adult shell cylindric-turrete, with close-set very fine striæ, which are more oblique in the upper half, more vertical in the lower half of the visible part of each whorl, glossy, greenish-brown, white at the suture. Remaining whorls 6½-8; on the upper whorls the striæ are comparatively stronger (so much elevated that the sculpture might be termed costulate), a little rough, and more equally oblique, being more vertical just above the suture only. The upper whorls are also distinctly more convex than the lower ones. Aperture very little produced beyond the suture, nearly circular, but rectilinear above, where it is nearest the preceding whorl, and making here a very obtuse angle with the strongly arcuated outer margin; peristome continuous, as usual in this genus, very shortly expanded, obtuse, white; columellar margin also well arcuated, but behind it, in the depth of the aperture, is a distinct white fold, rising up very steeply, without angle. Young specimens (figs. 32, 33) are somewhat concavely turrete, and resemble the figure 8c in Philippi's Abbildungen; they indicate that the whole number of whorls is at least 14 or more, but even in these the tip is truncated and the hole filled up by a convex whitish wall. The dimensions of the adult specimens (with continuous, expanded, and slightly produced peristome) are some what different, as shown by the following measurements:

Largest (8 whorls) 35 mm. long., diam. 9½; aperture 7½ long (high), 7 broad.

Smallest (7½ whorls) 24½ mm. long., diam. 8; aperture 6 long, 6 broad.

Most slender one (8 whorls) 25½ mm. long., diam. 7; aperture 6 long, 6 broad.

Angangueo, State of Michoacan, Mexico, under leaves of *Agave americana* (Hegewisch); *Omiltepec,* State of Guererro (H. H. Smith).

Bulimus truncatus Pfr., Symb. Hist. Helic. i, p. 43 (1841); Philippi's Abbild. neuer Conch. i, p. 55, pl. 1, f. 8; Monogr. Helic. Vivent. ii, p. 154, and viii, p. 131; Malak. Blätt. xxii, p. 37 (1872).—Reeve, Conch. Icon. v, Bulimus, pl. 70, fig. 1 (not pl. 69, fig. 498) (young specimen).—*Cylindrella truncata* (Pfr.), v. Mart. Malak. Blätt. xii, p. 13 (1865).—*Eucalodium truncatum* Fisch. & Crosse, Miss. Scient. Mex., Mollusca, i, p. 392.—v. Mart., Biologia, Moll., p. 264, pl. 16, f. 3-9.—*Eucalodium martensii* Strebel, Beitr. Mex. Land- und Süssw.-Conch. iv, p. 73, pl. 13, fig. 13, pl. 11, fig. 8(radula) and 14 (jaw), pl. 12, fig. 3 (genitalia). ? *Cylindrella transaperta* Sowb., Conch. Icon. xx, pl. 9, f. 77.

Not *Bulimus truncatus* Brug., Encycl. Meth. i, p. 310,—*Limnæa truncatula* (Müll.).

The figures and description are from von Martens' account in the *Biologia Centrali Americana,* based upon numerous specimens from Omiltepec, collected by Herbert H. Smith.

A very peculiar, small species, long known by the young shell only. The type of *E. martensi* Strebel is shown in fig. 24. *C. transaperta* Sowb. (fig. 25) may possibly be related, but it differs in the form of the aperture and the wider lip, and may belong to Urocoptis (*q. v.*). Its habitat is unknown.

(*Group of E. speciosum.* Sect. *Resupinata* v. Mart.).

Resupinata v. Mart., Biologia Centrali Americana, Mollusca, p. 255 (Nov. 1897), for *E. speciosum, edwardsianum, deshayesianum.*

"Shell somewhat fusiform, narrowed below, last whorl descending considerably beyond the suture, and the plane of the aperture thus very oblique; color yellowish or brown." Internal pillar very slender and straight. Type *E. speciosum.*

This group differs from typical *Oligostylus* in the thin shell

and greater free deviation and descent of the last whorl; but it is somewhat difficult to assort the species into the two groups. Several of them need re-examination to determine the character of the axis.

E. densecostatum, speciosum and *cereum* are very densely rib-striate; the others have more spaced or weak striæ, and are doubtfully referable to this group.

E. DENSECOSTATUM Strebel. Pl. 1, fig. 4.

Shell thick, rather cylindric, with about 8 whorls remaining; somewhat tapering above; suture somewhat margined. Last whorl only shortly free, at first pretty sharply keeled below, the keel then becoming a low cord. The aperture is pretty round, somewhat angular above; peristome shortly and rather strongly expanded and thickened. The internal pillar is rather straight throughout, the columellar fold short, deeply situated, and formed as in *E. edwardsianum* and *boucardi*. The most peculiar feature of the species is the sculpture, which consists of exceedingly closely placed but not very fine, slightly curved riblets (about 170 on the last whorl, which is 12 mm. wide). The intervals are so narrow that no sculpture can be seen in them.

Eastern Mexico: *Orizaba* (Botteri).

E. densecostatum STREBEL, Beitr. iv, p. 71, pl. 6, f. 10(1880). —v. MART., Biologia, Moll., p. 261.

No other species has similar sculpture; *E. boucardi* has a similar form, but coarser sculpture. *E. speciosum* Dkr. differs in the shape of the shell, the whorls and the more spaced riblets. Described from two dead discolored specimens.

E. SPECIOSUM (Dunker). Pl. 2, figs. 1, 2, 3.

Shell rimate, nearly cylindric, truncate, rather solid, subdiaphanous, whitish, silky, minutely costulate-striate, the striæ lightly arcuate, more obsolete in the middle of the whorls, whorls 9½, a little convex, slightly increasing, the last free in front, shortly descending, angular above. Columella with a twist or fold. Aperture obliquely oboval, angular above; peristome narrowly reflexed throughout. Length 21, diam. 5½ lines [about 42, 11 mm.] (*Dunker*).

Mexico (Gruner coll.); *Cordova* (Sallé, Höge); *Coatepec* (Höge); *Jalapa* and *Cuesta de Misantla* (M. Trujillo).

Cylindrella speciosa Dkr. in Phil., Abbild. u. Beschreib. i, p. 86, *Cylindrella* pl. 1, f. 19 (1844).—*Eucalodium boucardi* var. *minor,* Crosse & Fischer, Moll. Mex. i, p. 381, pl. 15, f. 6, 6*a*.—Strebel, Beitr. iv, p. 71, pl. 6. f. 6.—*E. speciosum* v. Mart., Biologia, Moll., p. 262.

Distinguished by its fine but strongly developed, thread-like riblets, silk-like luster, descending last whorl and small size. The internal pillar is very slender and straight. The type had evidently lost its cuticle and color, like a specimen before me. The riblets are less crowded than in var. *boucardi,* and the shell is more slender.

Var. boucardi (' Sallé ' Pfr.). Pl. 2, figs. 6, 7; pl. 8, fig. 18.

Shell arcuate-rimate, clavate-cylindric, truncate, rather thin, provided with close, somewhat arcuate hair-like riblets, transversely striated in the intervals; corneous-tawny. Suture light, slightly marginate. Whorls remaining 9 to 11, slightly convex, the last free in front, obliquely descending, angular above, obtusely carinate below the middle. Aperture angularly oblong, with a strong, twisted columellar fold; peristome white, narrowly expanded. Length 52-56, diam. 13 mm.; aperture 11 mm. long, 8½ wide (*Pfr.*).

Cordova, (Sallé, type locality), and *Orizaba* (Botteri), State of Vera Cruz.

Cylindrella boucardi Sallé, Pfr., P. Z. S. 1856, p. 321; Malak. Bl. 1856, p. 216; Conchyl. Cab. p. 35, pl. 8, f. 1, 2; Monogr. iv, p. 695; vi, 365; viii, 429.—*Eucalodium boucardi* Crosse & Fischer, Moll. Mex. i, p. 381.—Strebel, Beitr. iv, p. 70, pl. 5, f. 15.—v. Mart., Biologia, Mollusca, p. 262.

This form is larger than *speciosa* or the following varieties, but I agree with Prof. von Martens that it is not worthy of specific rank. The shape varies a good deal, two specimens measuring

Length 54, greatest diam. 12.3, diam. at apex 7 mm. 9¼ whorls.

Length 53, greatest diam. 13.5, diam. at apex 8.5 mm. 8½ whorls.

The ribs (pl. 8, fig. 18) are closer than in *E. speciosum.* The internal pillar is very slender and straight, merely dilated a little near the floor of each whorl.

Other specimens before me from Cordova are much smaller, down to 40 mm. long. The variations in the series lead me to believe that the varieties of *E. speciosum* are without much value.

Var. STREBELI v. Mart. Pl. 2, figs. 4, 5.

Identical with *E. boucardi* in form, sculpture, pillar and columellar fold, but more brownish, quite like *E. edwardsianum;* remaining whorls from 8½ to 11, weakly puffed at the sutures; form much as in *E. edwardsianum,* but it is more closely ribbed, with crowded spirals in the interstices. There are about 116 riblets on the broadest whorl (12 mm. broad).

Dos Arroyos, a village on the road from Jalapa to Naolingo, and Chirimoyo, a village near Jalapa.

E. boucardi form B., STREBEL, t. c., p. 71, pl. 5, f. 8, 9.—*E. speciosum* var. *Strebeli* v. *Martens,* Biologia, p. 262.

Var. MINIMUM v. Martens.

Small, brownish-straw colored; 8 whorls remaining; Length 39, diam. 10 mm.

Cordova (Sallé, Höge); *Atoyac* (H. H. Smith).

E. boucardi var. g CROSSE & FISCHER Moll. Mex. i, p. 381.—*E. speciosa* var. *minima* v. MART., Biologia, p. 262.

Var. FISCHERI v. Martens. Pl. 2, figs. 10, 11.

Somewhat solid, subdiaphanous, with a silken luster, pale tawny, whorls 8½ to 9½, minutely, arcuately rib-striate, the last suddenly descending, quite shortly free. Length 36, diam. 9½ mm.

Chiquihuitl, State of Vera Cruz (A. Sallé).

Eucalodium speciosum Dkr., CROSSE & FISCHER, Moll. Mex. i, p. 379, pl. 15, f. 7, 7*a*.—*E. speciosum?* var. *fischeri* v. MART., Biol. p. 262.

E. CEREUM Strebel. Pl. 7, figs. 4, 5, 6, 7.

Shell with some silky luster, thin though also strong, rather translucent, clothed with a very pale yellowish cuticle, some

narrow darker growth-striæ showing here and there. The sculpture consists of fine, pretty closely crowded riblets, distinctly raised from the somewhat horn-colored background, and about 135 in number on the penultimate whorl, which is 12 mm. in diam. In the interstices there is fine, rather regular spiral plication, which is not everywhere distinct. The 7½ to 8½ whorls remaining are narrowly and weakly margined. The last whorl is shortly free and produced at the aperture, at first more or less distinctly keeled, later having a more or less distinct cord. The peristome is shortly expanded, almost reflexed and thickened with whitish inside. The pretty strong, bar-like defined columellar fold is white and the interior is lined with a thin, white layer of enamel.

San Antonio del Monte, 3 leagues east from Naolingo, on the road to Misantla (Strebel).

E. cereum Strebel, Beitr. iv, p. 72, pl. 6, f. 9 (1880).

E. edwardsianum Crosse & Fischer. Pl. 2, figs, 8, 9, 12.

Shell arcuate-rimate, clavate-turreted, rather thin but somewhat solid, dull fleshy-whitish under a dark tawny-straw colored, glossy, in part deciduous cuticle. Spire tapering, rather broadly truncate; suture impressed; whorls remaining 9½, but slightly convex, regularly enlarging, sculptured with but slightly projecting, quite spaced and slightly oblique riblets; first 2 to 3 whorls attenuated, following 4 or 5 somewhat inflated, penultimate and last whorls somewhat tapering, the last suddenly descending, widely free, carried forward, and subcarinate above. Aperture slightly oblique, somewhat irregularly angulate-oval, livid whitish inside; peristome continuous, somewhat thickened, shortly reflexed throughout, dirty whitish; columellar margin with a high fold within. Length 48, diam. 13 mm.; aperture with peristome 9½ mm. long, 8 wide (*C. & F.*).

State of Vera Cruz, Mexico: *Cordova* (Sallé); *Agua Caliente, Hirial* and *Nacimiento de Quilate,* all near Misantla (Doña Estefania).

E. edwardsianum C. & F., Journ. de Conchyl. 1872, p. 224; Moll. Mex. i, p. 383, pl. 14, f. 10, 10*a*.—Strebel, Beitr. iv, p.

69, pl. 6, f. 11; pl. 11, f. 6, 7, 13; pl. 12, f. 1 (anatomy).—v. Mart., Biologia, p. 262. — *Cylindrella edwardsiana* Pfr., Monogr. viii, p. 437.

Similar to *E. boucardi,* but with more widely spaced riblets, with no spirals in the intervals. Strebel's figure of a specimen from near Misantla (fig. 12) is more slender than the type from Cordova (figs. 8, 9). Strebel counted 77 riblets on the penultimate whorl, which had a diameter of 12 mm.

E. deshayesianum Crosse & Fischer. Pl. 2, figs. 13, 14.

Shell slightly arcuate-subrimate, cylindric-turreted, rather solid; dull and pale fleshy-whitish under a somewhat glossy, pale yellow and almost completely deciduous cuticle. Spire slightly tapering, broadly truncate; suture deeply impressed. 7 to 8 whorls remaining, nearly flat, narrow, the first 3 or 4 slightly oblique and very delicately, following ones inconspicuously striatulate, the last whorl suddenly descending, very shortly free, obtusely angular above, obsoletely subcarinate below the middle. Aperture slightly oblique, irregularly subangulate-rounded, white within; peristome continuous, somewhat thickened, very narrowly reflexed throughout, white, the columella hardly folded within. Length 32, diam. 9½ mm.; apert. with perist. 7 mm. long, 6½ wide (*C. & F.*).

Southern Mexico (Ghiesbreght).

E. deshayesianum C. & F., J. de Conch. xx, p. 223, 1872; Moll. Mex. p. 384, pl. 14, f. 9, 9*a*.—v. Mart., Biologia, p. 263. —*Cylindrella deshayesiana* Pfr., Monogr. viii, p. 430.

Distinguished by its small size, narrow whorls, inconspicuous striation and the facility with which the cuticle is lost in adults. Only the two type specimens in the Museum of Natural History at Paris are known.

Genus ANISOSPIRA Strebel, 1880.

Anisospira Strebel, Beitrag zur Kenntniss der Fauna mexikanischer Land- und Süsswasser-Conchylien,, Theil iv, p. 77 (for *Cyl. liebmanni* Pfr. and *C. hyalina* Pfr.).

Shell imperforate, cylindric, pupiform or oblong-fusiform, the earlier whorls self-amputated, the adult shell consisting of 3 to 5 whorls of about equal width, the next earlier 2 or 3

whorls rapidly contracting, followed above usually by a cylindric whorl or two of far smaller calibre. The (deciduous) young shell has a rather large apex, smooth at first, followed by several straightly costulate whorls. Internal column straight or weakly spiral, perforated, in the last whorl or two encircled by a median and a subbasal cord or lamella, not visible in the circular or ovate aperture (pl. 11, figs. 1, 2, 4, 7). Soft anatomy unknown. Type *A. liebmanni.* (Gr. *anisos* unequal, and *speira* a coil, in allusion to the disparity between the early and late whorls).

Distribution, southern and southwestern Mexico.

This genus differs from *Eucalodium* in the rapid increase in diameter which takes place at the inception of the adult stage, and in the armature of the axial column, which is restricted to the last two whorls. In *Eucalodium* the diameter of the shell increases regularly, and the column is alike throughout its length. Though the axis is minutely perforate, there is no such axial cavity as is found in *Cœlocentrum.* The internal armature, as Strebel has noted, resembles that of *Holospira* and *Bostrichocentrum;* and it also finds a parallel in the Haitian group of large *Urocoptis* species. The last whorl is only shortly free in front, and the peristome is but very narrowly subreflexed or expanded. In most characters of the shell *Anisospira* resembles Jamaican species of *Urocoptis* of the group of *U. sanguinea;* but it differs in the larger nepionic shell and especially in the plug or septum of the amputated spire, in which *Anisospira* resembles *Eucalodium* and other Mexican genera, and not the Antillean forms.

Key to species of Anisospira.

I. Shell thin, very finely and densely rib-striate; a lamella encircling the pillar within the penultimate or the last whorl.

1. Diam. about one-third the length; white,
   a. whorls 7½ to 9; internal lamella at base of pillar, 1½ whorls long, *A. dalli.*
   b. whorls 10-13, *A. hyalina,*
2. Diam. contained about 2½ times in length; yellow-

ish-fleshy; whorls 7 to 8, internal lamella strong and flat, 2 whorls long. *A. liebmanni.*

II. Shell solid and strong, with moderately spaced rib-striation; flesh-tinted or pinkish; internal pillar weakly spiral, a blunt cord encircling its base within the penultimate whorl. *A. strebeli.*

A. HYALINA (Pfeiffer). Pl. 10, figs. 18, 19, 20, 21.

Shell rimate, truncate, ovate-oblong, suddenly tapering above, rather thin, diaphanous, hyaline. Whorls 10, a little convex, narrow, subequal, subarcuately delicately rib-striate, the last whorl shortly built forward, subangular above, obsoletely compressed at the base. Aperture subvertical; subcircular. Peristome free throughout, narrowly expanded. Length 37, diam. 12, aperture length 9, width 8 mm.; width of middle whorl 3⅔ mm. (*Pfr.*).

South-central and southeastern Mexico: *Oaxaca* (Deppe), probably *Tabasco* or *Chiapa* (Ghiesbreght).

Cylindrella hyalina PFR. in Philippi, Abbild. u. Beschreib. ii, p. 47, pl. 2, f. 2 (1847); Monogr. ii, 369; iii, 564; iv, 692; vi, 359; viii, 425; Conch. Cab., *Cylindrella,* p. 8, pl. 1, f. 13, 14. — v. MART., Malak. Blätt. xii, p. 14 (1865). — SOWERBY, Conch. Icon. xx, pl. 12, f. 110.—*Eucalodium hyalinum* Pfr., FISCHER & CROSSE, Moll. Mex. i, p. 388, pl. 15, f. 9, 9*a*.—v. MART., Biol. Centr. Amer., Moll., p. 266.—*Anisospira hyalina* Pfr., STREBEL, Beitr. Mex. Land- und Süssw.-Conch., iv, p. 79, pl. 13, f. 16.

The number of whorls varies somewhat, as more or fewer of the narrow ones at the summit are retained, there being sometimes as many as 13. It is distinguished from *A. liebmanni* by the greater number of whorls retained by the adult shell, and the pale color. *A. dalli* is a closely related form, which may eventually prove varietally related to *hyalina.*

A. DALLI (v. Martens). Pl. 10, figs. 28, 29; pl. 1, fig. 12.

"Shell thin, white, solid, opaque, decollated, the rejected spire having 14 whorls, and the remainder of the shell from 7½ to 9 whorls; apex of the young shell blunt, slightly dome-shaped, the nepionic shell smooth or faintly transversely

striated, subsequent whorls to the fifth subcylindric, the fifth slightly constricted, the spire very slowly increases in diameter until the decollation is reached; the first four whorls after the nucleus are conspicuously, elegantly, transversely ribbed, the riblets nearly straight, with subequal interspaces. Beyond the constriction the riblets are less conspicuous and more crowded and more oblique, and so continue evenly over the adult shell where the suture is distinct but not deep, the form somewhat fusoid, the basal whorl slightly contracted and subangulate at the periphery, the umbilicus closed and the aperture suborbicular and slightly reflected. The axis is moderately stout and twisted, with a single plait on the pillar, anteriorly, in the last and penultimate whorls, not however visible from the aperture, much as in *A. liebmanni* Pfeiffer (pl. 11, fig. 7). Length of decollate spire, 21 mm.; of decollated shell, 29 mm.; maximum diameter of shell, 10 mm.; of decollation, 6 mm." (*Dall.*).

Huilotepec, State of Oaxaca (E. W. Nelson).

Anisospira strebeli Dall., Proc. U. S. Nat. Mus. xix, p. 353, pl. 33, f. 7, 8 (Jan. 27, 1897); not of Pfeffer.—*Eucalodium dalli* v. Mart., Biol. Centr. Amer., Moll., p. 633 (Feb. 1901).

"This species is shorter and more slender than *A. hyalina* Pfeiffer, which has always one and sometimes two more whorls. It is of a whitish, not a pinkish tint, and the decollated portion of the spire is more cylindrical than in *A. hyalina*, which has a proportionally larger and more trumpet-like mouth. *A. liebmanni* is larger, stouter, of a brownish yellow color, and has a whorl less than the present species" (*Dall*).

Dall's original figures are copied on plate 10. Figs. 12 of plate 1, and fig. 7 of pl. 11, represent a specimen of the original lot in the collection of the Academy. It has 8 whorls, and measures, length 29, diam. 10 mm. The columellar lamella is very close to the base, and is shorter and much less prominent than in *A. liebmanni*. I have some doubts as to the distinctness of this species from *A. hyalina*, but I have not been able to compare specimens of the latter, which seems to differ chiefly in retaining more whorls in the adult state.

A. liebmanni (Pfeiffer). Pl. 10, figs. 22-27; pl. 11, figs. 1, 2, 3.

Shell rimate, cylindric-oblong, usually widest above the middle, rapidly contracting above, slowly tapering below; thin but moderately solid; pale brownish-yellow, with an indistinct reddish line at the suture. Surface very finely, regularly, closely and obliquely rib-striate, the riblets but slightly arcuate. Whorls 7 to 7½, scarcely convex, the last having the base defined by a scarcely noticeable cord. Aperture subcircular or rounded oval, oblique. Peristome whitish, very narrowly reflexed. Columella straight, somewhat oblique. Internal axis a straight and rather slender pillar, encircled in the last two whorls by a spiral lamella, which makes two spiral turns, is strongest within the penultimate whorl, and is not visible from the aperture. A very weak, more oblique spiral cord encircles the pillar above the lamella, in the last and penultimate whorls. Length 32, diam. 12.7 mm.; length of aperture 8.3, width 7.5 mm.

Mexico (Liebmann); *Barrio and Juchitan,* Isthmus of Tehuantepec (Sumichrast).

Cylindrella liebmanni Pfr., Zeitschr. f. Malak., 1846, p. 159; Monogr. ii, 370; iii, 564; iv, 691; vi, 359; Conchyl. Cab., p. 4, pl. 1, f. 9, 10; Philippi, Abbild., iii, p. 5, pl. 3, f. 1.—*C. leibmanni* Sowerby, Conch. Icon., xx, pl. 13, f. 46.—*Eucalodium liebmanni* Pfr., Fisch. & Crosse, Moll. Mex. i, p. 390, pl. 15, f. 10, 10 *a*, *b*.—v. Martens, Biol. Centr. Amer., Moll., p. 266.—*Anisospira liebmanni* Pfr., Strebel, Beiträge Mex. iv, p. 79, pl. 5, f. 12, 12 *a*, 13; pl. 14, f. 2 a, b.—*Cylindrella trochæformis* Sowerby, Conch. Icon. xx, pl. 9, f. 80 (young shell).

This species is thinner, smaller and more finely striate than *A. strebeli* Pfr., and the internal lamella upon the axis is much stronger than in any other known species. It retains fewer whorls than the more slender *A. dalli* and *A. hyalina.* Figures 27 and 1 represent a specimen collected by Sumichrast, from the isthmus of Tehuantepec.

In Pfeiffer's original type, collected by Liebmann (pl. 10, fig. 24; pl. 11, figs. 2, 3), the aperture is oval and a little an-

gular above (fig. 3), and the internal pillar is weakly spiral. A weak keel-like ridge encircles it midway, visible even in the fifth whorl from the last; in the penultimate whorl it is more conspicuous, but not very large. Under it, close to the partition, there is a rather strong flattened lamella on the pillar, which both increases and decreases rapidly (pl. 11, fig. 2).

The Sumichrast shells from Tehuantepec (pl. 10, f. 22, 23, 25, 27; pl. 11, fig. 1) differ in the straighter axis, which is not visibly sinuous, the much shorter and weaker median columellar cord, and perhaps the longer, less basally situated columellar lamella. The aperture moreover is more nearly circular. These differences, however, are probably not specific, but indicate local racial variation.

A young shell of the Sumichrast lot (pl. 10, fig. 25), examined by Strebel, has the nucleus smooth, then fine sharp ribs appear, which up to and including the third whorl are more spaced than on following whorls, the total number of which is 12.

A. STREBELI Pfeffer. Pl. 10, figs. 30-34; pl. 11, fig. 4.

Shell rimate, fusiform-cylindric or more or less swollen, solid and strong though not thick, grayish flesh-tinted or pink, without gloss. Surface sculptured with fine, regular rib-striæ separated by intervals of double their width. Whorls remaining 7 to 9, moderately convex, the last faintly or obsoletely keeled, a slight depression which is sometimes brownish just above the keel. Aperture oblique, produced shortly forward, rounded-ovate. Peristome pale, obtuse or thickened, narrowly expanded or sub-reflexed; columella straightened within. Internal axis a little swollen in the middle within each whorl and distinctly twisted in a weak spiral. This is noticeably stronger within the penultimate whorl, where it is accompanied by a second cord revolving immediately adjacent to the partition below.

Length 50, diam. 15, length of aperture 11½, width 10 mm.

Length 43, diam. 14, length of aperture 11, width 9½-10 mm.

Length 40, diam. 12, length of aperture 10, width 9 mm.

Length 38, diam. 13, length of aperture 10, width 9 mm.

Length 33, diam. 12-12½, length of aperture 8½-9, width 7½-8½ mm.

S. W. Mexico: *Cerro de Plumas,* near Puerto Angel, State of Oaxaca, on the Pacific coast, in a dense tropical forest (Höge).

Anisospira strebeli Pfeffer, Verh. Ver. f. Naturw., Hamburg, 1887, p. 21.—*Eucalodium strebeli* v. Martens, Biol. Centr. Amer., Moll., p. 265, pl. 16, f. 31-34.

Very variable in size and shape, as the measurements given above indicate. These are chiefly taken from von Martens' measurements of selected individuals out of a series of thirty. The shell is much more solid than *A. liebmanni*, with far coarser sculpture and different internal armature. Moreover, the taper above is less abrupt. In the larger, cylindrical shells the last four whorls are of about equal diameter, the next earlier three taper, another whorl remaining, beginning again the cylindrical shape of the young stage. In small shells (33 mm.) the last three whorls only are equal in diameter, three above them tapering, and the next earlier one upright again. In the smaller examples there is a distinct angle in front defining the base; in the larger ones this is wholly obsolete. The aperture also varies in shape.

Von Martens records a worn specimen, probably of this species, found by Mr. W. Lloyd at Culata, near Manzanillo, on the west coast of Mexico.

Genus CŒLOCENTRUM Crosse & Fischer, 1870.

Cylindrella of earlier authors.—*Eucalodium,* sect. 2, Crosse & Fischer, Journ. de Conchyl. xviii, p. 22 (1870).—*Cœlocentrum* C. & F., J. de C. xx, p. 302, type *C. turris* Pfr. (1872); Miss. Scient. Mex., Moll. i, p. 339.—Strebel, Beitrag Mex. Land- und Süsswasser-Conchyl. iv, p. 56.—von Martens, Biologia Centrali Americana, Moll., p. 267.

Shell rimate, cylindric-tapering or cylindric-fusiform, composed of many closely coiled whorls, the early ones usually self-amputated in adult shells, the body cavity plugged with a convex, granulose septum, *the cavity of the columellar axis*

visible as a round, exactly central hole. The last whorl becomes shortly free in front, and is usually girt below the middle by a low cord. Aperture irregularly ovate or rounded, the peristome continuous, narrowly reflexed throughout. Internal axis a somewhat fusiform polished *tube,* smooth or longitudinally costate. The usually deciduous early whorls taper gradually to the nepionic shell, which is rather large, cylindric or club-like, composed of 4½-7 whorls, the first smooth and bulbous, the rest more or less costulate.

Type, *C. turris* Pfr. Distribution, southern and southeastern Mexico to Guatemala, with an aberrant group in Lower California.

The soft anatomy is known by Strebel's dissection of a specimen of *C. arctispira* from near Misantla.

Foot very long. The body lobes of the mantle consist of a divided right, a left, and a posterior lobe. The salivary glands are extremely loose masses around the first part of the œsophagus and retractor. The transverse rows of the radula imbricate so that the ends of the cusps reach to the beginning of those in the next row. The central teeth have small side-cusps, laterals with an ectocone (pl. 19, fig. 44). The foundation of the jaw (pl. 19, fig. 41) is a structureless, hyaline membrane, bordering the true horn-colored smooth jaw on all sides, projecting rather broadly between the ends and the large median projection. The penis is very short and wide, with terminal retractor, the v. d. inserted beyond the middle. Spermathecal duct long (pl. 19, fig. 42). The retractor muscle (pl. 19, fig. 43) of the left tentacle is united to that of the pharynx proximally, that of the right tentacle being free, but there are slender bands running from the pharyngeal retractor to both tentacular retractors anteriorly. There is no muscular plate over the pharynx, as in *Eucalodium.* Two long muscles arise from the columellar muscle and pass forward to the mantle-edge.

I. *Species of moderately large calibre, normally losing many of the early whorls by autotomy.*

1. Internal axis large, with a sub-median (spiral) swelling within each whorl, crossed by numerous

obliquely vertical lamellæ. Nepionic whorls unknown.. *Cœlocentrum* s. str.

2. Internal axis without vertical sculpture.
   a. Internal axis cylindric or swollen within each whorl, smooth. Exterior of the shell with more or less spiral sculpture developed. Nearly 7 nepionic whorls, the first dome-like, the rest cylindric, obsoletely costulate, especially near the sutures. *Liocentrum,* p. 46.
   b. Internal axis sub-cylindric, within the last and penultimate whorls encircled close to the base by a spiral lamella. Nepionic shell unknown. *Elasmocentrum,* p. 49.

II. *Slender species, retaining all of the whorls in maturity.*
   c. Internal axis hollow but slender, smooth, swollen within each whorl. Whorls many (16-22), higher and less crowded than in other subgenera. Nepionic shell of about 5 whorls, the apex bulbous, first 2½ whorls vertically straightly costellate, next 2 whorls decussated, granulose. *Spartocentrum,* p. 50.

Section Coelocentrum s. str.

In this group the internal pillar is swollen below the middle within each whorl, excavated below this spiral ridge, and sculptured with obliquely longitudinal riblets or lamellæ, which vary from smooth to serrate at the free edges, and are often irregularly interrupted, some of them replaced by granules scattered on the polished surface of the tube. The riblets do not extend into the excavation below the ridge, and in one species, *C. astrophorca,* there is a spine on each where it crosses the spiral ridge.

The species are rather numerous and not often separated by strongly marked characters. The following key is therefore of no great value. The number of preserved whorls is quite variable individually, and is not even constant in shells of the same dimensions.

I. Rather large species, the diam. 12 mm. or more.
  a. Remaining whorls 12 in a length of 80 mm.; ribs rather strong. *C. gigas*, p. 33.
  b. Remaining whorls 13 in a length of 54 mm.; riblets numerous and close. *C. anomalum*, p. 35.
  c. Remaining whorls 9 in a length of 53 mm.; riblets numerous and irregular spirals. Tuxtla, S. E. Mexico. *C. nelsoni*, p. 35.
  d. Remaining whorls 8½ in a length of 43 mm.; sculpture of crowded, delicate lines, no spirals. State of Chiapas. *C. pfefferi*, p. 34.
  e. Remaining whorls 16-24 in length of 55-72 mm.; thin, fusiform, the riblets very close, fine and weak. *C. turris*, p. 36.

II. Smaller forms, diam. 6-10, length usually 20-40 mm.
  a. Ribs of the internal column produced in spines at their junction with the spiral convexity. *C. astrophorea*, p. 45.
  b. Ribs often serrate but not bearing spines.
    c. Apex retained entire; whorls 27, length 41, diam. 9 mm. *C. t. attenuatum*, p. 40.
    c^1. Early whorls lost in the adult.
      d. Whorls short, very closely coiled, about 18 in a length of about 38 mm. *C. arctispira*, p. 42.
      d^1. Whorls short, very convex, 11 in a length of 30 mm. *C. dispar*, p. 44.
      d^2. Whorls less short, but slightly convex. *C. tomacella*, p. 38; *C. t. clava*, p. 39; *C. fistulare*, p. 41.

C. GIGAS v. Martens. Pl. 9, figs. 1, 2, 3, 4, 5.

Shell measuring 21 mm. in diameter and 80 mm. in length (truncate), yellowish-grey, with numerous rather fine, somewhat arcuated costulæ, of which there are 98 on the whorl before the last, somewhat unequal and irregular, the interstices twice or thrice their breadth; spiral striæ in the interstices very feeble, none on the costulæ (fig. 5). Whorls a

little convex, numbering 12 in the adult truncate example, about 24 in all, to judge from comparison with a young specimen; the height of the visible part of a whorl varying from ⅖ to ⅓ of its diameter, the middle whorls being not so high as the upper and lower ones; the last seven whorls nearly equal in diameter, the preceding ones gradually diminishing upwards, so that the whole shell is turrete, but not properly fusiform. Base of the last whorl rounded, with a rather broad and shallow spiral furrow in the prolongation of the suture, instead of the usual angular line (fig. 3). The aperture, in the single, perhaps not quite perfect, adult specimen is scarcely produced beyond the suture, and its edges are very thin and shortly expanded; the opening is 17 mm. high and 16 mm. broad, irregularly rhomboidal, with an obtuse angle at the base, but rounded above. The columellar plait inside the aperture is rather strong, pale orange, and ascends in a straight oblique line. The costulæ of the columellar axis are numerous, about as broad as their interstices, and descend in a straight line (*v. Mart.*).

E. Guatemala: *Livingston,* in the Bay of Honduras (O. Stoll).

Cœlocentrum gigas Martens, Biologia Centrali Americana, Moll., p. 267, pl. 16, f. 27, 28, a-c (Nov., 1897).

The largest species known. "Fig. 4 represents a younger individual, which has not yet lost so many whorls."

C. pfefferi Dall. Pl. 11, figs. 5, 6.

Shell subcylindric, with 8½ whorls, attenuated above, rounded below, solid, decollate, the whorls gently rounded with a distinct suture, without spiral sculpture, transverse sculpture of delicate, hardly arched, little raised, crowded lines, subequal over the whole surface; base rounded, the basal area bounded by an obscure line, umbilicus reduced to a minute perforation, aperture rounded below, slightly angular above, usually free but occasionally adnate to the body whorl; axis normal, small at the decollation; color pale livid pink, whitish near the aperture. Length 43, maximum diameter 15, diam. at decollation 7 mm. (Dall).

Ocozucuantla [Ocozocoautla], State of Chiapas, Mexico (E. W. Nelson); types No. 107367, U. S. N. M.

C. pfefferi Dall, Proc. U. S. Nat. Mus. xix, p. 352, pl. 33, f. 1, 2 (Jan. 27, 1897).—v. Mart., Biol., p. 634.

This species is shorter, stouter, and less cylindrical than *C. turris*, Pfeiffer, which has proportionally more numerous whorls, and is smaller and more fusiform than *C. Nelsoni*. It is respectfully dedicated to the distinguished naturalist of Hamburg, Dr. G. Pfeffer, well known for his work on Mexican land shells in conjunction with H. Strebel. (*Dall*).

C. nelsoni Dall. Pl. 11, figs. 8, 9.

Shell large, strong, decollate, retaining 9 whorls, subcylindric, attenuated more rapidly at the upper 2 or 3 whorls, periphery flattish, suture distinct, strong, not deep; transverse sculpture of numerous rather asperate concavely arched little raised ridges, stronger near the sutures and usually with wider interspaces; spiral sculpture of somewhat vermicular obscure character like the markings left by a "sand-blast," but occasionally developing sparse distant fine spiral riblets, and stronger on the later whorls; base rounded except for the obscure peripheral line, the umbilicus almost closed; aperture rounded below, slightly angular, oblique, free from the body whorl, with the margin continuous and reflected but narrow; axis normal, nearly closed at the decollation where it is small, but large in the latter whorls; color pale straw. Length 53, maximum diameter 18, diameter at decollation 8 mm. (*Dall*).

Tuxtla, Mexico. (E. W. Nelson); type No. 107368, U. S. N. M.

C. nelsoni Dall, Proc. U. S. Nat. Mus. xix, p. 352, pl. 33, f. 5, 6 (Jan. 27, 1897).

"This shell recalls *Eucalodium compactum* Pilsbry, but is more cylindrical and stouter, besides having a totally different axis. It is the largest known species of the genus, and is dedicated to the indefatigable naturalist E. W. Nelson, who has added so largely to our knowledge of the American fauna from Alaska to Guatemala." Dall.

C. anomalum Strebel. Pl. 9, figs. 6, 7.

Shell rather transparent, almost lustreless, as if breathed upon, and of a violet-chocolate-brown color, changing to more yellowish towards the summit. The lower half of the last

whorl is dirty flesh-color, sharply defined in the umbilical region, but lost toward the aperture. The 13 remaining whorls are flatly arcuate, rapidly tapering above, while below the contraction is hardly noticeable. The last whorl is only shortly free, and somewhat turned outward. The umbilical carina is only weakly modeled, while the dorsal keel or cord distinctly projects, especially at the beginning. The sculpture consists of fine, sharp, close-set and but slightly arcuate riblets on the upper whorls, which on following whorls become more spaced, more irregular and weaker. On the last half of the last whorl they become close again, but without increasing much in sharpness. On the penultimate whorl, which is 14½ mm. broad, I count about 100 of these rib-like folds. The cuticle appears under the lens finely wrinkled, the wrinkles running spirally, so that there is a sort of spiral striation. The internal column is only moderately swollen within each whorl. Its exterior is rather closely set with with very fine lamellæ, the free edges of which, especially in the lower whorls, are finely serrate. The whole internal column is whitish flesh-colored. The aperture is triangular-oval, the peristome shortly but pretty strongly expanded, nearly reflexed, white outside and within, and only weakly thickened. The interior shows a yellowish-bronze zone behind the white peristome, which then passes into dirty violet-white. The compresed and oblique columellar fold is distinctly visible. The umbilicus is represented by a narrow chink only.

Coban, Guatemala (Sarg).

Cœlocentrum anomalum Strebel, Beitrag iv, p. 59, pl. 6, f. 8; pl. 14, f. 5.—v. Martens, Biologia, p. 270.

Violet chocolate-colored, with the base of the last whorl dirty flesh-colored. Internal column densely set with finely serrate vertical lamellæ. Description from Strebel's account.

C. turris (Pfeiffer). Pl. 12, figs. 1, 2, 3, 4, 5.

Shell deeply rimate, cylindric below, tapering above, very thin, light brown. Surface sculptured with fine, arcuate ribstriæ, which are sharp, close and regular above, weaker and somewhat irregular on the lower half of the shell. Whorls remaining 16 to 24, convex, very slowly increasing in width,

the last shortly free in front, the pale-colored convex base defined by a low cord, while a stronger, arcuate keel at the base defines the umbilical area. Aperture rounded, oblique, the peristome continuous, white, rather broadly reflexed throughout. Internal column large (6 mm. diam. in a shell of 14 mm. diam.), conspicuously bulging, the greatest convexity at about the lower third in each whorl; sculptured with rather wide-spaced, obliquely longitudinal, low lamellæ, which are highest on the convexity, and mostly do not run below it. These lamellæ are somewhat irregularly spaced, and irregular at the free edges, and there are some granules scattered on the polished surface of the pillar.

Length 55, diam. 14 mm.; whorls 16.

Length 68-72, diam. 14 mm. (*Pfr.*).

Chiapas, in southeastern Mexico (Ghiesbreght).

Cylindrella turris Pfr., P. Z. S. 1856, p. 380, pl. 36, f. 2; Mal. Blätt. 1856, p. 217; Conchyl. Cab., p. 35, pl. 8, f. 20, 21; Monogr. iv, p. 695; vi, 365—Bland, Ann. Lyc. Nat. Hist. of N. Y., viii, p. 160.—Sowerby, Conch. Icon. xx, pl. 13, f. 117.—*Eucalodium turris* Crosse & Fisch., Journ. de Conchyl. xvi, p. 88; xviii, p. 22.—*Cœlocentrum turris* Fisch. & Crosse, Moll. Mex., i, p. 345, pl. 15, f. 13.—Strebel, Beitrag, iv, p. 56, pl. 5, f. 18; pl. 14, f. 2 a, b.—v. Martens, Biol. Centr. Amer., Moll., p. 270.

Thin and light for a shell of its size. It differs from other large species by the greater number of whorls preserved in the adult shell. "Varies in the length of the adult shell from 59-72 millim., and in the breadth of the penultimate whorl from 12½-14 millim. Number of preserved whorls 16-24. The variation in the length of the adult shell does not depend entirely upon the number of preserved whorls; I have before me a specimen measuring 61 millim. with 16 preserved whorls, and another of 60 millim. with 19 preserved whorls. The greater the number of preserved whorls, the more strongly is the shell attenuated upwards.

"The figures in Reeve's *Conchologia Iconica*, 77 millim. long, represents a specimen with an unusually large number of preserved whorls, viz., 27." (v. Mart.)

C. TOMACELLA (Morelet). Pl. 12, figs. 6, 7; pl. 14, figs 21-25.

Shell deeply rimate, swollen-turreted, rather thin, diaphanous, arcuately, very closely striate, somewhat silky in appearance, brownish-corneous; spire strongly tapering upwards, rather broadly truncate, suture impressed, lightly submarginate-crenate, whorls remaining 14, subequal, a little convex, the last a little receding under the penultimate, shortly free, compressed-carinate at the back and base, having a thread-like keel below the middle. Aperture suboblique, irregularly subtriangular-oval, pale fleshy-whitish inside; peristome continuous, narrowly expanded and a little reflexed throughout, whitish; parietal margin sloping, forming an angle with the spreading left margin. Foramen of the truncate spire moderately large, perspective.

Length 35, diam. scarcely 10 mm.; aperture with peristome 6½ mm. long, 5¼ wide (*F. & C.*).

Length 37, diam. 10 mm. (*Morelet*).

Woods of *Tabasco*, and in the *ruins of Palenque*, State of Chiapas (Morelet); *Coban*, Guatemala (Sarg).

Cylindrella tomacella MOREL., Testacea Novissima i, p. 10, no. 11 (1849).—PFR., Monogr. iii, p. 568; Conchyl. Cab. p. 36, pl. 4, f. 19, 20.—SOWERBY, Conch. Icon. xx, pl. 14, f. 124.—*Cœlocentrum tomacella* FISCH. & CROSSE, Moll. Mex. i, p. 342, pl. 15, f. 11.—STREBEL, Beitrag iv, p. 58, pl. 6, f. 3.—MARTENS, Biologia, p. 271.—*Cylindrella morcleti* DESHAYES, in Fér. Hist., ii, p. 227, pl. 164, f. 16-18 (1851).

Excessively near *C. clava* Pfr., but according to Crosse & Fischer more swollen, a little smaller and paler, with fewer whorls and perceptibly finer striation. The more obese shape is its chief distinctive character. A specimen before me, pl. 14, figs. 21-25, is corneous-whitish, with no brown tint, retains 13 whorls, and measures, length 33, diam. 9½ mm. The internal pillar is strongly swollen below the middle within each whorl, rather abruptly contracted below the swelling. It is sculptured with widely and irregularly spaced lamellæ and some scattered granules representing dislocated and broken-up lamellæ. The free edges of the lamellæ are irregularly and more or less serrate (pl. 14, fig. 23). The external sculpture

of the shell consists of fine, close flat riblets wider than the intervening grooves except on the last whorl, where they are narrower. Fig. 24 of pl. 14 represents the sculpture of the fourth whorl up, fig. 25 of the last whorl.

Var. CLAVA (Pfeiffer). Pl. 12, figs. 11, 12, 13, 14; pl. 14, figs. 26, 27.

Shell deeply arcuate-rimate, turreted-cylindric, truncate, rather thin, closely arcuate-striate, diaphanous, but slightly shining, tawny. Spire a little tapering above, rather widely truncate. Whorls remaining 16-21, moderately convex, the last shortly free, carinated above and at the base, and with a thread-like keel at the side. Aperture squarish-oval, channelled at the base, columellar fold slight, deep; peristome continuous, white, expanded and a little reflexed throughout. Length 42-57, diam. 9-10 mm.; aperture with peristome 8 mm. long, 7 wide (*Pfr.*).

Chiapas, Mexico (Ghiesbreght).

Cylindrella clava PFR., P. Z. S. 1856, p. 380; Malak. Blätter 1856, p. 217; Conchyl. Cab., p. 36, pl. 8, f. 11, 12; Monogr. iv, p. 696; vi, 365.—BLAND, Ann. Lyc. N. H. of N. Y., viii, p. 160 (1865).—SOWERBY, Conch. Icon. xx, pl. 13, f. 115 *a, b.*—*Cœlocentrum clava* Pfr., FISCH. & CROSSE, Moll. Mex. i, p. 346, pl. 15, f. 14.—STREBEL, Beitrag, iv, p. 57, pl. 5, f. 10; pl. 14, f. 8. —v. MARTENS, Biologia, p. 270, with var. *rufescens*, p. 271, pl. 16, f. 2 (Nov., 1897).

"Very near *C. turris* but smaller, varying in total length from 40 to 57 mm., and in the breadth of the penultimate whorl from 9 to 10 mm. Number of preserved whorls 15-20."

Pfeiffer's description is given above, and his type figures are copied on pl. 12, figs. 11, 12, representing a specimen with the maximum number of whorls and largest size mentioned in the original description. This narrow, markedly cylindric form must be considered the type. A smaller specimen, also narrow, is figured by Strebel from Pfeiffer's collection. On pl. 14, figs. 26, 27, I figure a Chiapas specimen in the collection of the Academy. It is corneous-white, with only 12 whorls, and measures, length 32½, diam. 8½ mm.

Another specimen is light reddish-brown, with 13 whorls

remaining, and measures, length 37, diam. 9½ mm. The internal column is very strongly swollen below the middle within each whorl, abruptly contracted below the swelling, and is sculptured with very irregularly spaced, more or less serrate lamellæ, which within the penultimate whorl are chiefly broken into white granules.

Var. *rufescens* v. Mart. Pl. 12, fig. 8.

Smaller and more cylindrical, pale reddish-brown, the aperture more protracted (3½ mm.) and comparatively smaller. Length 42 mm.; diam. of the penultimate whorl 8, largest diam. (third whorl before the last) 8½ mm.; preserved whorls 15; aperture 6 mm. long, 5½ broad. Mexico, Pätel coll. (*v. Martens*).

This form seems to differ but slightly if at all from typical *clava* Pfr., though it is unlike the *clava* of Crosse & Fischer in contour.

Var. ATTENUATUM (Pfeiffer). Pl. 12, figs. 9, 10.

Shell deeply rimate, swollen-turreted, rather thin, closely arcuate-costulate, diaphanous, corneous. Spire attenuated above, the apex entire, obtuse. Suture margined; whorls 27, a little convex, the last narrower, shortly free, obsoletely thread-carinate below the middle; base compressed. Aperture a little oblique, suboval, somewhat channelled at the base; peristome continuous, whitish, narrowly reflexed, the columellar margin dilated, spreading. Length 41, diam. 9 mm.; greatest length of aperture, inside, 4½, width 3⅔ mm. (*Pfr.*).

Chiapas, Mexico (Ghiesbreght).

Cylindrella attenuata PFR., Malak. Blätt. iii, 1856, p. 258; Conchyl. Cab., pl. 9, f. 1, 2; Monogr. iv, p. 698.—CROSSE & FISCHER, Moll. Mex., p. 404.

The type of this species was an individual with the apex entire, such as occurs rarely among normally decollate cylindrellas. I am disposed to place under *attenuatum* the shell figured as *clava* by Crosse & Fischer (pl. 12, fig. 13), as well as some of the specimens before me, which differ from typical *clava* in their greater attenuation above. One of these is pale brownish, with 19 whorls remaining, and measures, length 39½, diam. 9 mm.

C. FISTULARE (Morelet). Pl. 9, figs. 16, 17, 18, 19, 20.

Shell narrowly rimate, cylindric-turreted, rather thin, subdiaphanous, very densely arcuate-striate, but little shining, gray-whitish. Spire attenuated above, rather widely truncate; suture impressed, lightly submarginate-crenate, whorls remaining 11 to 12, subequal, slightly convex, the last scarcely receding under the penultimate, free in front, shortly protracted, compressed-carinate above and at the base, thread-keeled a little below the middle. Aperture oblique, irregularly subtetragonal-oval, dull whitish inside; peristome continuous, narrowly expanded and a little reflexed throughout, whitish; left margin forming an angle with the horizontal parietal and with the basal margins, outer margin very much arched. Foramen of the truncate spire rather wide, slightly perspective. Length 28, diam. 8 mm. Aperture 5 mm. long, 5 wide. (*C. & F.*).

Northern Guatemala: *forests of Peten* (Morelet); *Vera Paz* (Salvin); *Coban* (Sarg).

Cylindrella fistularis MORELET, Test. Noviss. i, p. 10, no. 12. —PFR., Monogr. iii, p. 569; Conchyl. Cab., p. 38, pl. 4, f. 21, 22.—*Cœlocentrum fistulare* Fisch. & Crosse, Moll. Mex. i, p. 343, pl. 15, f. 12, 12 *a*.—STREBEL, Beitrag iv, p. 58, pl. 6, f. 2; pl. 14, f. 1 A, B.—MARTENS, Biologia, p. 272.—*Cylindrella arctispira* TRISTRAM, P. Z. S. 1863, p. 412 (not of Pfr.).

Very near *C. tomacella*, but differing in the gray-whitish color, more lustreless shell, usually smaller size, slightly less swollen shape, and subtetragonal rather than subtriangular aperture. It has fewer whorls, slightly less fine striation, and finally a narrower umbilical fissure. These differences, found by Crosse and Fischer on comparing the types of both species, are rather elusive, and in actual practice probably of little value. Probably *C. fistulare* should be subordinated to *tomacella* as a mere race or variety. Strebel, who examined specimens brought by Sarg from Coban, states that the sculpture scarcely differs from that of *tomacella*. The whorls are very feebly convex. The internal column is strongly swollen, with fine and serrate lamellæ in the upper whorls, later increasingly stronger, so that in the middle whorls the serrations are almost

knot-like. Crosse & Fischer's figures of the type are copied on my plate 9, figs. 17, 18. Pfeiffer's figures of a form possibly referable to the next species are also given, figs. 19, 20.

C. ARCTISPIRA (Pfeiffer). Pl. 14, figs. 33-36.

Shell rimate, cylindric-turreted, broadly truncate, rather solid, closely subarcuate-ribbed, somewhat opaque, whitish; suture deep, subnodulose, whorls remaining 18, narrowly coiled, convex, the last narrower, thread-carinate, shortly protracted forward. Aperture small, oblique, obliquely oval; peristome continuous, glossy, narrowly reflexed throughout, the left margin laterally produced. Length 38, diam. 10 mm.; oblique length of aperture 6⅔, width 6 mm. (*Pfr.*).

Juquila, State of Oaxaca (Boucard, type locality); *Istapa*, State of Tabasco (Sallé). Var. *estefaniæ* at *Quilate*, *Agua Caliente, and Arroyo del Banco*, all in the environs of Misantla, V. C. (Doña Estefania Salas).

Cylindrella arctospira PFR., P. Z. S. 1860, p. 139, pl. 50, f. 2 (see below under *C. aristispica*).—*Cylindrella arctispira* PFR., Malak. Blätter viii, p. 81; Monogr. Hel. Viv. vi, p. 377; vii, p. 438.—SOWERBY, Conch. Icon. xx, pl. 14, f. 123.—*Cœlocentrum arctispirum* C. & F., Moll. Mex. i, p. 348, pl. 15, f. 15.—Martens, Biol. Centr. Amer., Moll., p. 271.—?STREBEL, Beitrag iv, p. 58, pl. 6, f. 4 (shell); pl. 14, f. 3 (internal axis); pl. 11, f. 9, 15; pl. 13, f. 10 (anatomy).

The original description is given above, and the original figure is copied in my fig. 33 of pl. 14. This figure corresponds with the original description neither in size nor the number of whorls given by Pfeiffer, and therefore does not represent the type specimen. In size, the figure given by Sowerby (pl. 14, fig. 34) comes near Pfeiffer's measurements, though a little larger, and it has the same number of whorls. Probably it is the type. This figure, however, shows a strongly ribbed shell unlike the forms figured by Crosse & Fischer and by Strebel.

C. arctispira as identified by Fischer and Crosse, from specimens collected by Sallé at Istapa, State of Tabasco (pl. 14, figs. 35, 36), measures, length 36, diam. 10 mm., apert. with perist. 6 mm. long, 5 wide; whorls 17. It is quite solid but sufficiently translucent to show the internal column indis-

tinctly through the shell; sculptured with close and distinctly arcuate riblets; light fawn-colored. The internal structure is unknown, and the identity of the form with Pfeiffer's type is not unquestionable.

Cylindrella aristispica "Pfr. MS." of Sowerby, 1875, was based upon *the specimen* figured as *arctispira* in the Proc. Zool. Soc. 1860, pl. 50, fig. 2 (my pl. 14, fig. 33), although this identity was not recognized by Sowerby and has not hitherto been announced. The status of *C. arctispira* being uncertain, as explained above, that of Sowerby's species (the name of which is probably due to the misreading of a label) awaits examination of the types. Sowerby's description follows:

"Shell solid, rather pyramidal, tumid below the middle, olive-brown striped with reddish-brown, regularly striated, contracted above, rather ventricose in the middle and below; permanent whorls 16, depressed, last contracted, notched [rimate]; aperture roundish, margin thick, round, columella slightly plaited. Habitat unknown." (*Sowb.*)

"*Cyl. aristispica* Pfr. ?MS. Brit. Mus.," Sowerby, Conch. Icon. xx, pl. 1, f. 5 (1875); *C. aritispica* Pfr., Sowerby, in index to *Cylindrella*.—*C. aristispira* Sowerby, v. Martens, Biologia, Moll.,p. 272.

Var. estefaniae nov. Pl. 14, figs. 28, 29, 30, 31, 32.

The specimens from Quilate, Agua Caliente and Arroyo del Banco, all near Misantla, reported by Strebel, have a feeble satin sheen, are but little transparent, and dirty yellowish or yellowish-brown in color, with sparse, narrow, somewhat darker growth-streaks. The shell is more or less tapering above, and has 17 to 20 whorls remaining, which are moderately convex and proportionately lower than in *C. tomacella*. The last whorl shows the umbilical keel only slightly, but the dorsal keel or cord is distinctly developed; it runs free somewhat longer than in *tomacella* and *fistulare*, but does not descend. The external sculpture consists of fine closely placed scarcely arcuate ribs, of which there are about 200 on the broadest (9 mm.) whorl. The axial tube is comparatively broad, only moderately swollen within each whorl. The lamellæ upon its outer surface are similar to those of *C. toma-*

cella, only standing somewhat closer, and in part stronger (see pl. 14, fig. 31). At the suture a fine thread-like thickening may be distinctly seen. The aperture is similar to that of *C. tomacella;* the peristome is white, the interior dirty yellow in the paler specimen, reddish-brown in the darker ones. The columellar fold is not visible from the front. The umbilicus is not wholly closed, there being a small chink left.

In the absence of information upon the internal structure of the types of Pfeiffer and the specimens described by Crosse & Fischer, it is impossible to say what relations exist between either of them and the specimens described by Strebel; but from the finer sculpture of the latter, I am disposed to believe that they will prove specifically distinct from Pfeiffer's type in the Cuningian collection.

C. DISPAR n. sp. Pl. 17, figs. 16, 17, 18, 19.

Shell deeply rimate, cylindric-fusiform, attenuated above, thin, a little translucent, light brown. Surface but little shining, very densely, closely and regularly rib-striate, the riblets strongly arcuate, becoming still finer and closer on the last half whorl, about seven in the space of one mm. on the front of the penultimate whorl. Whorls remaining a trifle over 11, *very convex*, the last but little narrower than the preceding, having only a slight, obtuse angle in place of the umbilical keel, and with no trace of a cord bounding the base; moderately protracted forward. Aperture oblique, irregularly rounded, brown inside; peristome very light brown, expanded and narrowly subreflexed throughout, the upper margin straightened, left margin somewhat dilated. Columellar fold visible deep within, obliquely entering. Length 30, diam. (of third and fourth whorls from the base) 9 mm.; longest (oblique) axis of the aperture 5¾, width 5⅓ mm.

Internal column large (3½ mm. wide), strongly swollen below the middle within each whorl, irregularly sculptured with rather low ribs, which are smooth or but weakly serrate, and do not pass below the convexity of the tube. They become shorter in earlier whorls, are confined to the convexity in the fifth from the base, and are wanting in still earlier

whorls, the tube being smooth, with some opaque whitish streaks. *Guatemala.*

Well distinguished by the narrowly coiled and very convex whorls, which are much less numerous than in any of the forms referred to *C. arctispira.* The sculpture, moreover, is far finer than described for that species, being slightly finer than in *tomacella. C. fistulare,* which agrees in size with *C. dispar,* is described as with slightly convex whorls, while in *dispar* the convexity is very conspicuous. The individual whorls are shorter or lower than in *fistulare,* and the free portion of the last whorl does not descend. Possibly Pfeiffer's figures of *fistulare* pertain to *C. dispar.* Fig. 17 represents the sculpture of the front of the penultimate whorl.

C. ASTROPHOREA Dall.

Shell pale yellow-brown, decollate, with 15 remaining whorls, the first six of which taper, while the rest are subequal; suture distinct, minutely channelled, or with a sharp edged thread on each side of it, surface polished with concavely flexuous small ribs with wider interspaces, on which is visible obscure spiral striation; last whorl keeled below, projecting, aperture rounded-triangular, slightly reflected, simple; axis large, pervious except at the base; within the whorl with a medial keel on each side of which it is excavated and vertically ribbed, while from the junction of keel and ribs small spines like the rays of a star project into the lumen of the whorl. Alt. 30, max. diam. 7, aperture 4.7 mm. (*Dall*).

Encarnacion, State of Hidalgo, Mexico (E. W. Nelson).

C. astrophorea DALL, Nautilus xi, p. 62 (October, 1897).—"*C. acanthophorea* Dall," v. MARTENS, Biologia Centrali Americana, Moll., p. 634 (Feb., 1901).

Though the spines [upon the internal pillar] are obviously merely an evolution from the usual nodes, they are remarkable, and hitherto unrecorded in any species. (*Dall*).

C. LUDERSI (Pfeiffer).

Shell perforate, oblong-cylindrical, widely truncate, rather solid, finely and subarcuately striate, fleshy-whitish, whorls remaining 8, flat, joined by a linear suture, the last provided with a strongly projecting keel. Aperture slightly oblique,

subangular-piriform; peristome white-calloused, interrupted, shortly reflexed, the columellar margin subvertical, within slightly folded above. Length 22½, diam. 8½ mm.; oblique length of aperture 5, width 4 mm. (*Pfr.*)

Cyl. lüdersi Pfr., Monogr. Hel. Viv. iv, p. 712 (1859); Malak. Bl. xxiii, p. 217.

Said to be from S. Domingo (Lüder's coll.). In his review of the *Monographia* Pfeiffer states that this species "differs from the rest of the Cœloeentrums in that the hollow internal column shows also an external perforation at the base." The species has not been figured, and the interrupted peristome seems an unusual character for this genus. If really a Cœlocentrum, as Pfeiffer states, the locality, given with doubt by Pfeiffer, must be erroneous.

Section Liocentrum Pilsbry, 1902.

This group differs from typical *Cœlocentrum* in wanting riblets or lamellæ upon the smooth internal pillar, which may be either cylindric or swollen within each whorl. Type *C. filicosta* (Shuttl.).

See under *C. filicosta* for description of the apex (pl. 18, fig. 38).

I. Rather small species, diam. 6½-9½ mm., length 22-30 mm.; ribs rather widely spaced, the intervals spirally striate.

a. Internal pillar swollen within each whorl; riblets well spaced. *C. filicosta*, p. 47.

b. Internal pillar cylindric; riblets a little closer. *C. crosseanum*, p. 47.

II. Larger forms, diam. about 14 mm.; costulæ of the outer surface numerous and feeble. *C. championi*, p. 49; *C. clathratum*, p. 49.

Strebel has already remarked that in this group there are some opaque white lines in the substance of the smooth column, taking the place of costulæ on the internal pillar.

In the last two species the internal column is described as with very faint costulæ, and in *championi* at least it is figured by von Martens as remarkably slender, almost like that of *Eucalodium* (pl. 9, f. 14).

The exact affinities of *C. championi* and *clathratum* remain to be determined.

C. CROSSEANUM (Pfeiffer). Pl. 17, figs. 26, 27, 28, 29.

Shell deeply rimate, cylindric, tapering above, rather solid, chestnut colored. Surface glossy, sculptured with arcuate riblets, about 5 in the space of 2 mm. on the antepenultimate whorl, somewhat closer on the penult, and becoming crowded on the latter part of the last whorl, the intervals much wider than the ribs, and sculptured with coarse, obliquely spiral, descending striæ. Whorls remaining 10 to 10½, convex, the last free in front, rounded basally, the base bounded by a low, cord-like keel. Aperture oblique, rounded-oval, livid fleshy or violaceous within; peristome continuous, whitish, narrowly expanded.

Internal column smooth and glossy, very slightly swollen below the middle within each whorl.

Length 29.2, diam. 9 mm.; longest axis of apert. 6.2, width 5.5 mm.

Length 29. diam. 9.5 mm.; longest axis of apert. 7, width 6 mm.

State of Vera Cruz, E. Mexico: *Orizaba* (Botteri); *Cuautlatitlan,* between Jico and Perote, N. of Orizaba (Doña Estefania Salas).

Cylindrella crosseana PFR., Journ. de Conchyl. xv, 1867, p. 437; Monogr. vi, p. 378; Novit. Conch. iii, p. 437, pl. 97, f. 26, 27.—*Eucalodium crosseanum* C. & F., Journ. de Conchyl. xviii, p. 22.—*Cœlocentrum crosseanum* FISCH. & CROSSE, Moll. Mex. i, p. 351, pl. 15, f. 16, 16 *a*.—STREBEL, Beitrag iv, p. 60, pl. 6, f. 1 *a-d*, 5; pl. 14, f. 4, 7 A, B.—MARTENS, Biologia, Moll., p. 272.

This is a larger shell than *C. filicosta*, with finer rib-sculpture and a straighter internal column, that of *C. filicosta* being swollen within each whorl, while in *crosseanum* it is hardly perceptibly so.

C. FILICOSTA (Shuttleworth). Pl. 18, figs. 38, 39, 40, 41.

Shell deeply rimate, cylindric, tapering above, rather thin, light yellowish-brown or greenish, glossy, sculptured with

rather widely spaced, narrow, arcuate riblets, about 2 in the space of 1 mm. on the front of the penultimate whorl, becoming irregular, crowded, or in part obsolete on the latter part of the last whorl; the interstices finely wrinkled or striate spirally. Whorls remaining 11½-12, convex, closely coiled, the last produced forward, rounded beneath, the base defined by a low cord or none. Aperture slightly oblique, irregularly rounded, the peristome expanded and narrowly subreflexed throughout. Internal axis smooth, polished, distinctly swollen within each whorl. Length 23.6, diam. 7.5 mm.; longest axis of aperture 4.6, width 4.2 mm.

State of Vera Cruz, E. Mexico: *Cordova* (Guillarmod and Sallé); *Orizaba,* about 500 ft. above the town (Heilprin Exped.).

Cylindrella filicosta Shuttl., Diagn. neuer Moll., iii, p. 36, in Mittheil. der Natur. Ges. in Bern, 1852, p. 296.—Pfr., Monogr. iii, p. 573; Conchyl. Cab., p. 19, pl. 2, f. 30, and pl. 8, f. 9, 10.—Sowerby, Conch. Icon. xx, pl. 12, f. 107.—*Cœlocentrum filicosta* Fischer & Crosse, Moll. Mex., i, p. 352, pl. 15, f. 17, 17 a.—Strebel, Beitrag, iv, p. 61, pl. 5, f. 14.—Martens, Biologia, p. 272.

A somewhat smaller species than *C. crosseanum,* with slightly more spaced ribs, and the internal pillar is swollen near the middle. It must be by a mistake that Fischer & Crosse figure and describe the axis of *filicosta* as "rather distantly, somewhat obliquely and obsoletely ribbed;" for three specimens I have opened, as well as those examined by Strebel, present but a smooth pillar.

A specimen from Orizaba (pl. 18, figs. 39, 40) measures, length 25, diam. 7 mm., aperture 4 x 3.8 mm., and retains 14 whorls. It has the internal sculpture and the pillar of the species, and cannot be referable to *crosseanum.* A very young specimen (pl. 18, fig. 38) shows the dome-shaped first whorl to be smooth. The next 5 whorls are equal in diameter, weakly ribbed below the suture. The whorls then increase rather rapidly in diameter,and the rib-sculpture of the adult form begins on the ninth one. The detail figure of sculpture (fig. 39) is from the front of the antepenult. whorl.

C. CHAMPIONI v. Martens. Pl. 9, figs. 12, 13, 14, 15.

One broken specimen somewhat intermediate between *C. gigas* and *C. clathratum;* 14 mm. in diameter, of a yellowish-grey color, white at the suture; costulæ more feeble and numerous, above 100 in the whorl before the last, the interstices of the same width, or scarcely twice as broad, spiral striæ very faint, not crossing the costulæ (fig. 15). The 3-4 terminal whorls of equal diameter. An angular line, and beneath it a very shallow furrow at the base of the last whorl, more feeble near the aperture. Costulæ at the outside of the columellar axis very faint. Aperture protracted 4 mm. beyond the suture, obliquely oval, angulate above and below, 13½ mm. in oblique height and 11 mm. in breadth; peristome thickened, expanded, white. (v. Martens.)

W. Guatemala: *Cerro Zunil* (Champion).

C. championi v. MART., Biologia, p. 269, pl. 16, f. 26, 26 a-c (November, 1897).

C. CLATHRATUM v. Martens. Pl. 9, figs. 8, 9, 10, 11.

More turrete than fusiform, in this respect resembling the preceding (*C. championi*), but of a paler yellowish-grey color, the costulæ also feeble and somewhat more oblique in the lower whorls, 87-90 in the whorl before the last, also somewhat unequal, the interstices mostly twice as wide as the costulæ; the spiral striæ fine, traversing not only the interstices, but also the costulæ themselves, and giving to them an irregular, waved appearance. Whorls scarcely convex, 10 remaining in the adult shell, the terminal 3-4 of equal diameter, the last at the base with a very feeble angular line, which quite disappears near the aperture. Umbilical rima arcuated. Costulæ of the columellar axis very faint, scarcely visible. Aperture protracted 4½ mm. beyond the suture, obliquely oval, somewhat angulated above and below; peristome thin, a little expanded. Length of the truncate shell 54, diameter 14 mm.; aperture 12 long, 9 broad. (*v. Mart.*)

W. Guatemala: *Hacienda Buenavista* in Upper Cholhuitz, Costa Cuca, at an elevation of 3500 feet above the sea. (O. Stoll.)

C. clathratum v. Mart., Biologia, Moll., p. 269, pl. 16, f. 29, a-e, 30 (Nov., 1897).

Subgenus Elasmocentrum Pilsbry, 1902.

Like typical *Cœlocentrum* in the general form of the shell and the large, hollow internal column; but the latter is smooth externally, and in the last two whorls there runs a spiral lamella like that developed in *Anisospira*.

C. exlex n. sp. Pl. 17, figs. 20, 21, 22, 23.

Shell deeply rimate and perforate, cylindric-fusiform, the upper third tapering, last whorl distinctly contracted under the penultimate, fourth whorl from the last widest; rather thin, whitish flesh-tinted. Surface lustreless, sculptured with irregular, strongly arcuate riblets, about 6 to 7 in the space of a mm. on the front of the penultimate whorl, about 4 on the front of the last whorl. Whorls remaining 12¼, very convex and *very narrowly coiled,* the last rounded basally and above, girt by a low cord bounding the base; becoming free in front. Aperture oblique, almost circular, brownish inside; the peristome expanded, narrowly subreflexed. Length 23, diam. 7.6 length of aperture 4, width 4.5 mm.

Internal column large, its greatest diam. about 3 mm., white, polished and without longitudinal sculpture. Within each whorl it is concave, becoming convex near the base, not contracted below the convexity. Within the last and penultimate whorls it is encircled close to the base by *a sharp and rather strong spiral lamella,* the lower end of which may be seen weakly appearing in an oblique view in the mouth.

Mexico, exact locality unknown.

With the narrow whorls and rather coarse sculpture of typical *C. arctospira,* this species differs conspicuously in the far smaller number of whorls retained. The interior of typical *C. arctospira* is unknown, but the form referred to that species by Strebel has a pillar with longitudinal sculpture, totally unlike the column of this species, which stands unique in the genus, and indeed closely approaches that of *Anisospira*. The detail figure of sculpture (fig. 23) represents the front of the last and penult. whorls.

Subgenus SPARTOCENTRUM Dall, 1895.

Spartocentrum DALL, Nautilus ix, p. 51, type *C. irregulare* Gabb.—*Tencritia* J. MABILLE, Bulletin de la Soc. Philomathique de Paris (8), ix, 1896-1897, p. 79, types *Berendtia digueti* and *B. minorina* Mab.

Shell, many-whorled, slender, cylindric below, tapering above, retaining the apex entire. Apex bulbous, the first 2½ whorls vertically costellate, following 2 whorls decussated, granose, subsequent whorls ribbed, the last with no trace of a subperipheral cord, adnate or becoming free. Internal axis hollow, smooth, somewhat sinuous within each whorl, having a spiral swelling or convexity. Type *C. irregulare*.

The species of this group are all from the arid plateau of the central portion of Lower California. They differ from the geographically separated Mexican group in retaining the early whorls in adult life, in the special sculpture of these whorls, and in the attenuation of the shell, which approaches *Epirobia* in form. *Berendtia* has similar apical sculpture, but differs in the very slender and imperforate axis.

Key to Species.

I. Last whorl in contact with the preceding one to the aperture, the upper margin of the peristome adnate.
irregulare, p. 51.

II. Last whorl becoming free in front.
1. No interstitial striæ between the riblets.
a. Whorls 21-22 in a length of 23.5 mm.; diam. 2.7 mm.; riblets on penult. whorl about 47.
eisenianum, p. 55.
b. Whorls 16½-18½ in a length of 24-25 mm.; diam. 4.5 mm.; riblets about 62 on penult. whorl.
minorinum v. *gabbi*, p. 54.
2. Striæ in the intervals between riblets; whorls 19-20; length 30½-33; diam. 5 mm. *digueti*, p. 56.

C. IRREGULARE (Gabb). Pl. 13, figs. 15, 16; pl. 17, fig. 24.

Shell rimate, narrowly umbilicate or perforate, cylindric-tapering, thin; white or pale reddish-brown in the bleached

specimens known. Regularly ribbed, the ribs about as wide as the intervals, a little arcuate, and about 4 in the length of a mm. on the penultimate whorl. Number of whorls unknown, as those with fully-formed apertures are decollate, with no closing septum above, and therefore it is impossible to state whether the shell is normally subject to autotomy or has an entire spire. In the type specimen (fig. 15) there are nearly 12 whorls; in another, more perfect individual (pl. 17, fig. 24) there are 13, and judging by allied species, about six have been broken off. Whorls convex, the last having the base a little flattened and smoother, or strongly convex with undiminished ribbing, a cord running around the verge of the umbilical area, but with no subperipheral cord. Aperture subvertical, rounded below, straightly truncate above. Peristome well expanded, the columellar margin broadly dilated, parietal margin adnate to the preceding whorl.

The internal pillar is smooth, somewhat sigmoid within each whorl, there being a strong median spiral bulging or swelling. The hole above has a diameter of about 0.8 mm. in a specimen broken to 3⅓ whorls (fig. 16).

Length (broken) 19, diam. 4.2 mm. (type).

Length (broken) 21.6, diam. 4.8, longest axis of apert. 4, width 4 mm.

Muleje, on the east coast of Lower California, below 27 degrees latitude, under loose volcanic rocks (W. M. Gabb).

Cylindrella (*Urocoptis*) *irregularis* Gabb, Amer. Journ. of Conch. iii, p. 238 (in part), pl. 16, f. 4 (Jan. 2, 1868).—*C.* (*Gongylostoma*) *irregularis* Binney, Land and Fresh-water Shells of N. A., i, p. 23, fig. 17.—Pfr., Monogr., viii, p. 448.—*Holospira irregularis* Tryon, Amer. Journ. Conch. iii, p. 313, pl. 21 (15), fig. 30; Monogr. Terrestr. Moll. U. S., p. 140, pl. 15, f. 30.—*Cœlocentrum irregulare* Fischer & Crosse, Moll. Mex., i, p. 349, pl. 17, f. 10 (fragment).—Pilsbry, Proc. A. N. S., Phila., 1900, pp. 553, 554, f. 3, 4.

Differs from other Lower Californian species in having the last whorl adnate to the preceding to the aperture, with no tendency to become free. The aperture is but slightly oblique, and differs from the other species in shape. There are 58

riblets on the penultimate whorl of the specimen shown in fig. 16.

Gabb's description, with all the others cited above except the last reference, was composite, as he had two very distinct species mixed in his type lot. As much, if not more, of the description applies to *C. minorinum* var. *gabbi* as to the present species; but as the figure given by Gabb himself, by Tryon and those by Binney were all drawn from one specimen (drawn in my fig. 15 of pl. 13), I have considered it best to accept this as the type, as Gabb manifestly selected it as such.

In my former work on this species I mentioned four fragmentary specimens in the type lot; but on further examination I find that two of these belong to one individual, which has now been mended, and is shown in fig. 24 of pl. 17. The lower part of the same shell was drawn in fig. 16 of pl. 13.

J. G. Cooper, in the American Journal of Conchology, iv, 1868, p. 212, footnote, states that "Mr. R. H. Stretch has recently brought from near Carson Valley, Nevada, latitude 39 degrees, fossils, or rather casts, closely resembling the *Holospira newcombiana* and *H. irregularis* Gabb of Lower California. They occur, he says, in the same formation that contains *Carinifex,*" etc. Nothing further is known of these fossils.

C. MINORINUM (Mabille).

Shell elevated, subcylindrical, deeply and narrowly rimate, toward the apex elongately attenuated, thin, pale buff, a little shining; apex obtuse, whitish, striate; four embryonic whorls ornamented with beautiful granulose spiral striæ, visible only under a lens; spire high, contracting below the apex; provided with numerous regularly placed, nearly straight riblets; interstices nearly smooth; whorls 17, convex, regularly increasing, separated by deep sutures, the last whorl of equal width with the penultimate, a little compressed, angular toward the suture, very obtusely carinated on the back, solute, slightly descending; aperture a little oblique, angular above, ovate, obscurely channelled at base of the columella; peristome spreading, slightly thickened, continuous; outer margin regu-

larly curved, columellar margin patulous, everted in the middle; columella twisted, slightly thickened. (*Mabille.*)

Plateaux above the arroyo de la Purissima, Lower California. (Diguet.)

Berendtia minorina J. Mabille, Bull. Soc. Philomath. de Paris (8), vii, 1895, p. 70.—Cf. Pilsbry, Proc. A. N. S., Phila., 1900, p. 551.

No dimensions are given, and the species has not been figured. The locality may be near the Mission de la Purissima, above the twenty-sixth parallel in W. longitude 112 degrees.

Var. gabbi Pilsbry. Pl. 13, figs. 17, 18, 19.

Shell very slender and lengthened, cylindrical below, tapering and attenuated above, retaining the apex perfect; thin, rather fragile, covered with a light brown cuticle; composed of 16½-18½ whorls, of which the initial one is globose, the earlier 4½ form a cylindric or apically swollen portion; increase in the diameter of the shell beginning with the fifth whorl and continuing for about 6 whorls, the remaining whorls of about equal diameter; all whorls decidedly convex, separated by well-impressed sutures, the last somewhat more lengthened, a little flattened peripherally, its latter portion becoming free (*Cylindrella*-like), the solute portion variable in length, somewhat descending, decidedly carinated above, obtusely angular at base, with a slight spiral groove within the margin of the umbilical tract, the umbilicus pervious but small. Sculpture: earliest 2⅓ whorls with close, fine, straight vertical riblets only, the next 2 whorls with the riblets cut into beads by spiral striæ; following whorls with strong arcuate riblets separated by intervals of their own width, and about 62 in number on the next to the last whorl. Aperture irregularly ovate, decidedly oblique, its length contained about five and one-half times in that of the shell; peristome thin, moderately expanded throughout, the inner margin dilated and obtusely angular in the middle; columella slightly concave, a little excavated below. Internal column rather slender, smooth oblique and slightly gibbous below, less swollen within each whorl than in *C. irregulare.*

Alt. 24.5, diam. of last whorl above aperture 4.5, longest axis of aperture 4.5 mm.; diam. of second whorl of the apex 1.7 mm.

High table-land of the interior of Lower California, especially about Muleje (W. M. Gabb).

Cylindrella irregularis Gabb *et al.* in part.—*Cœlocentrum minorinum* var. *gabbi* Pils., Proc. A. N. S., Phila., 1900, p. 551 (Nov. 10, 1900).

Compared with *C. irregulare* Gabb, this form is somewhat more attenuated, with the latter part of the last whorl projecting free, the aperture more oblique and of a wholly different form, strongly resembling that of *Berendtia taylori.* The riblets are more slender and threadlike. It differs from *C. digueti* in being smaller, with fewer whorls, without sculpture between the riblets, and with scarcely any observable twist to the columella. It is evidently more nearly allied to *C. minorinum;* but the riblets are arcuate rather than "*fere rectilineis;*" only the third and fourth whorls have spiral granulose striæ; the last whorl can hardly be said to be "*versus suturam angulato, dorso obtusissime carinato;*" the aperture is not "*paululum obliqua,*" but decidedly oblique. Whether these differences indicate specific or varietal distinction cannot well be decided in the absence of a figure or dimensions of Mabille's species, or of specimens for comparison.

The specimens were confused by Gabb with his *C. irregularis.*

C. eisenianum Pilsbry. Pl. 13, figs. 20, 21, 22; pl. 17, fig. 25.

Shell excessively slender and lengthened, the upper half much attenuated, retaining the apex in adult individuals; thin, rather fragile, light brown. Whorls 21-22, the first globose, the second slightly wider, then decreasing slightly in calibre to the fifth; the earlier 4½ whorls thus forming a pupoid or slightly club-shaped nepionic portion, below which the diameter slowly increases; last 4 or 5 whorls of nearly equal diameter. All whorls strongly convex; the last whorl a trifle flattened peripherally, its latter third becoming free and deviating tangentially somewhat, the free portion carinated above, having a cord-like keel around the umbilical region below.

Umbilicus small. Sculpture: first 2½ whorls bearing very close, fine, delicate vertical riblets; next 2 whorls with these riblets cut into granules by spiral decussating lines; following whorls with close, fine, slightly arcuate riblets, about 47 in number on the next to last whorl. Aperture decidedly oblique, rhombic, its length contained nearly eight times in that of the shell; peristome thin, continuous, slightly expanded throughout. Internal axis smooth, sinuous, strongly swollen near the base within each whorl.

Alt. 23.5, diam. of last whorl above aperture 2.7, length of aperture 3 mm.; diam. of second whorl of the apex 1.3 mm.

Lower California (Fred. L. Button).

C. eisenianum Pils., Proc. Acad. Nat. Sci. Phila., 1900, p. 553 (Nov. 10, 1900).

This species differs from *C. minorinum* var. *gabbi* in the following respects: With the same length it has a much more slender form, more numerous and narrower whorls, coarser costulation and a smaller aperture. The apical whorls are, moreover, rather more club-shaped. It is not closely related to any other species known.

In one specimen (pl. 17, fig. 25) the last whorl is more extensively free in front, and descends much more.

C. digueti (Mabille).

Shell subrimate-perforate, cylindric, tapering towards the apex, somewhat thin and rather fragile, a little opaque, destitute of cuticle, grayish-buff, scarcely shining; beautifully ornamented with obtuse, lamellose riblets, their interstices seen under a lens to be quite regularly set with very minute arcuate striæ and riblets. Apex obtuse, mammillate; 4 to 5 embryonic whorls cancellated and beautifully granulose. Whorls 19-20, convex, slowly and regularly increasing, the last equal to the penultimate and slightly exceeding the antepenultimate in width; separated by a deep suture; the last whorl free, rounded, slightly tapering, descending in front, carinated at its insertion, with a short, obtuse keel surrounding the umbilical perforation. Aperture oval, angulate above, obscurely channelled below at the base of the columella.

Peristome free, expanded, thin, acute, the outer margin well arched, the spreading columellar margin somewhat covering the perforation. Columella twisted-arcuate, obscurely toothed at the base. Length 30½ to 33, diam. 5 mm. (Mabille).

Lower California: *Plateau de San Zavier,* 25 degrees N. lat. (Diguet).

Berendtia digueti J. Mabille, Bulletin de la Société Philomathique de Paris, vii, 1894-1895, p. 70.

Larger than the other Lower Californian species, having the last whorl free, and distinguished by its intercostal sculpture. The locality assigned may mean the Mission of San Xavier, near the parallel of 26 degrees N. lat.

Genus BERENDTIA Crosse & Fischer, 1869.

Berendtia C. & F., Journal de Conchyliologie, xvii, 1869, p. 191; xviii, 1870, p. 22; Miss. Scient. Mex., Moll., i, p. 300.—Pfr., Monogr., viii, p. 450.

Shell rimate turreted, straightly tapering to an obtuse rounded apex which is retained in adult shells. Whorls about 11, the first 2 vertically costellate, the next having the riblets cut into spiral series of granules (pl. 18, fig. 35); last whorl becoming free in front, acutely keeled above. Aperture oblique, semicircular-ovate, the peristome broadly expanded and subreflexed. Internal axis imperforate, very slender and weakly sigmoid within each whorl (pl. 18, fig. 34, penult. whorl).

The foot is short, acuminate behind, with a median longitudinal groove in a contracted state. The genital system is simple. Penis very long without noticeable dilation. The small rounded spermatheca is borne on a narrow duct as long as the penis. The nervous system resembles that of *Eucalodium.* The jaw (pl. 19, fig. 45) is very thin, arcuate, having 9-13 wide ribs separated by narrow, cross-striated intervals. The radula has 126 rows of 30.1.30 to 32.1.32 teeth, in nearly straight transverse rows. The centrals are tricuspid, lateral and marginal teeth bicuspid (pl. 19, figs. 46, 47).

Type *B. taylori* Pfr. Table-land of Lower California.

This genus resembles the closely related group *Spartocen-*

trum in the sculpture of the early whorls, which are retained in the adult stage in both groups. It is more like *Eucalodium* in the slender internal axis, but differs in the entire spire, the shape of the aperture and the ribbed jaw.

B. TAYLORI (Pfeiffer). Pl. 18, figs. 30-36.

Shell deeply creased in the umbilical region but imperforate, turreted, regularly tapering, reddish-brown. Surface sculptured with strong curved and oblique riblets, the intervals densely and finely striate spirally. Whorls 11-11½, but slightly convex, separated by an impressed suture, the last whorl free and descending in front, more or less angular at the periphery, having a rounded ridge at the base, and an acute keel above. Aperture irregularly ovate, angular above, the outer margin rounded, inner more straightened. Peristome continuous, broadly flaring.

Length 48, diam. of last whorl above aperture 9 mm.; longest axis of aperture 12-13, breadth 10⅓ mm.

Length 49, diam. of last whorl above aperture 8 mm.; longest axis of aperture 12, breadth 10 mm.

Length 46, diam. of last whorl above aperture 8 mm.; longest axis of aperture 12, breadth 10 mm.

High table-lands of the interior of Lower California, especially about Muleje, under loose volcanic rocks (W. M. Gabb).

Clausilia? (*Balea?*) *taylori* PFR., P. Z. S., 1861, p. 27, pl. 2, f. 7; Malak. Blätt., 1861, p. 83; Monogr. Hel. Viv., vi, p. 516. —SOWERBY, Conch. Icon., xx, pl. 1, f. 6.—*Cylindrella* (*Urocoptis*) *newcombiana* GABB, Amer. Journ. of Conch., iii, p. 237, pl. 16, f. 3 (1867).—*Holospira newcombiana* Gabb, TRYON, A. J. Conch., iii, p. 314, pl. 21 (15), f. 33.—*Cylindrella taylori* Pfr., BINNEY, Land and Fresh-water Shells of N. A., i, p. 189, f. 328 (shell), 329 (teeth and jaw).—*Berendtia taylori* Pfr., CROSSE & FISCHER, Journ. de Conchyl., xvii, 1869, p. 191; xviii, 1870, p. 22, pl. 5, f. 11-17 (anatomy); Miss. Scient. au Mex., Moll., i, p. 304, pl. 14, f. 1 (shell), pl. 16, f. 1-4 (anatomy).

Very distinct from other known forms. Pfeiffer's type measures, length 47, diam. 8½, aperture with peristome 13

mm. long, 11 wide. There is some variation in the length of the free portion of the last whorl and in the proportion of breadth to length, sufficiently shown in the figures.

Genus EPIROBIA Strebel & Pfeffer, 1880.

Epirobia Strebel, Beitrag zur Kenntniss der Fauna Mexikanischer Land- und Süsswasser-Conchylien, iv, pp. 77, 85, *E. berendti, polygyra, morini-polygyrella, apiostoma.*—Pilsbry & Vanatta, Proc. A. N. S. Phila., 1898, p. 281, type *E. polygyra.*—*Cylindrella* and *Holospira* of some authors.

Shell thin, brown or corneous, rimate, many-whorled, retaining the apex complete; slender and lengthened, attenuated above, with the last whorl straightened and shortly free, not carinate at the base. Apex obtuse, several succeeding whorls not increasing in diameter, smooth; following whorls striate or costulate (pl. 18, fig. 37). Internal axis rather slender but hollow, sculptured with longitudinal white streaks or irregular lamellæ, or granules formed by their dislocation and interruption.

The genital system (pl. 19, fig. 48, *E. apiostoma*) is imperfectly known from data obtained by Strebel & Pfeffer from a dried specimen. A branch of the main right retractor band is inserted on the atrium, and a long, band-like gland is accessory to the vagina. This gland is apparently lined with gigantic mucous cells (pl. 19, fig. 49), and its cavity communicates with that of the vagina. Only the lower portion of the spermathecal duct is shown. The penis has a stout retractor muscle laterally inserted, the vas deferens being apical.

The jaw is unknown. The radula of *E. polygyra* (pl. 50, f. 6, 7) is strap-shaped, bearing 18.1.18 teeth in slightly curved and sinuous transverse rows, which near the edges become more oblique. The middle row consists of teeth with the basal plate short and square, the very broad, rounded middle cusp projecting beyond it, side cusps small, *basal, and separated from the mesocone.* The adjacent lateral teeth are similar except that the entocone is wanting. The passage from lateral to marginal teeth takes place by the large cusp becoming more acute, then developing an inner spur or entocone, which

gradually becomes larger. On the middle and outer marginals the ectocone is split, the teeth being thus low and wide, with two deeply bifid cusps, not differing much in length.

In *E. berendti* (pl. 20, fig. 4) Strebel shows somewhat pointed mesocones, the central tooth with the ectocones concrescent with the main cusp. Formula 27.1.27. I have some doubts of the correctness of the figure, *and strongly suspect that Strebel transposed the radulæ of E. berendti and Holospira goldfussi.*

Type, *E. polygyra* (Pfr.). Distribution, eastern and southern Mexico (States of Vera Cruz and Chiapas) and northern Guatemala.

This group is related to *Holospira,* differing chiefly in the greater attenuation and lengthening of the shell, and especially in the more slender early whorls. The radula however is more and differently specialized in *Epirobia,* both ento- and ecto-cones being developed in the teeth of the median field, basal in position and separated from the very large, rounded mesocones; while in *Holospira* the teeth of the median field have single, simple, conic cusps. The Lower Californian group *Spartocentrum* has the same general contour, persistent spire and hollow axis, but in that group the early whorls are sculptured and the internal pillar smooth, while in *Epirobia* the nepionic shell is smooth and the pillar roughened. There is great external resemblance to the species of *Brachypodella* inhabiting the same districts, but these have a slender, imperforate axis, and a keeled base, while *Epirobia* has a hollow axis and a rounded base. Crosse & Fischer and von Martens seem to have been unaware of the difference in internal structure, as they mingle the species of *Brachypodella* and *Epirobia* without regard to it. Strebel fully grasped the significance of the structure of *Epirobia* in his work of 1880.

The internal pillar has sculpture fundamentally like *Cœlostemma* and even more like typical *Cœlocentrum;* but the riblets have been much interrupted, so that in some species they are hardly recognizable as such.

The genital system requires re-examination with fresh material, Strebel's work thereon having been based upon dried

animals, at best an unsatisfactory basis for critical work, even in the hands of so skillful an operator.

The specialization of both shell and radula seem to me to make a union of this genus with *Holospira* unnatural.

Key to Species of Epirobia.

I. Diameter contained 4-5 times, and longest axis of aperture 5-5½ times in length of the shell.
   1. Whorls 14; 12½ x 3 mm.; very closely rib-striate. *E. berendti*, p. 61.
   2. Whorls 17; 14 x 3 mm.; very closely and finely hair-striate. *E. gassiesi*, p. 63.

II. Diam. contained 6-8 times, and aperture 8-10 times in length of shell.
   1. Whorls 21; 18 x 2½ mm.; minutely rib-striate, the striæ white, absent in places. *E. swiftiana*, p. 62.
   2. Whorls 22-24; 16 x 2 to 17 x 2⅓ mm.; finely arcuate-striate. *E. apiostoma*, p. 63.
   3. Whorls 22; 14 x 2¼ mm.; whorls very short; closely arcuate-striate. *E. polygyrella*, p. 65.
   4. Whorls 24-27; 17-19 x 2½ mm.; fine thread-like striæ. *E. polygyra*, p. 64.

E. BERENDTI (Pfeiffer). Pl. 20, figs. 1, 2, 3.

Shell deeply rimate, subperforate, cylindric-turreted, very closely rib-striate, slightly silky, violaceous-brown; spire entire, the apex subacute, pale; suture deep. Whorls 14, convex, the last becoming free, shortly produced forward, cylindrical, somewhat compressed dorsally. Aperture slightly oblique, rounded, subangular above; peristome continuous, a little expanded throughout. Length 12½, diam. 3 mm.; longest axis of aperture 2½ mm. (*Pfr.*).

Toxpan (*Tuxpan*), on the slope of the mountain Matlaguiahuitl, near Cordova, State of Vera Cruz (Berendt).

Cylindrella berendti PFR., Malak. Blätt., xiii, 1866, p. 87; Monogr., vi, p. 381.—FISCHER & CROSSE, Miss. Scient. Mex., Moll., i, p. 409.—*Epirobia berendti* Pfr., STREBEL, Beitrag, iv, p. 86, pl. 13, f. 1; pl. 14, f. 18.—*Holospira berendti* Pfr.,

Martens, Biologia, Moll., p. 281.—*C. b.* var. *albida* F. & C., t. c., p. 409.—*E. berendti,* specimens from Chiapas, Strebel, t. c., p. 86, pl. 3, f. 7.

Pfeiffer's type in Dohrn's collection has been examined by Strebel. It is of a brownish-horn more or less dark color, on which the fine riblets stand sharply out, their crests being bluish-white or whitish. This white thickening often does not extend over the whole extent of the rib, and frequently is interrupted, when the ribs are not only less conspicuous to the eye, but are really flatter. Quite exceptionally single or several ribs are omitted. The axial tube has no inflations, but there are thickened whitish striæ and traces of the oblique, short series of lamellæ or long grains.

Var. *albida* (Fisch. & Crosse).

Color whitish instead of violaceous brown. Length 12, diam. 3 mm.

State of Chiapas (Dr. Berendt).

The dentition has been figured by Strebel (see pl. 20, fig. 4; the basal plates are not visible owing to the strong imbrication of the cusps). The formula is 17.10.1.10.17 x 200. In my opinion this radula belongs to *Holospira goldfussi,* having been transposed by error.

E. swiftiana (Crosse). Pl. 20, figs. 20, 21, 22.

Shell slightly rimate, fusiform-turreted, elongate, thin, subpellucid, sculptured with very close, minute, whitish, arcuate riblets, here and there obsolete, showing the ground-color of the shell, which is quite glossy and corneous-brown; an alternation of brown and white, dull and glossy, being thereby produced. Spire slender, entire, the apex rounded, submammillate; suture impressed. Whorls 21, convex, the first 1½ smooth, glossy, brown, the rest narrow, the last whorl rather shortly free, a little protracted downwards, obsoletely subangular above and below. Aperture subangulate-rounded, slightly oblique, pale chestnut inside; peristome continuous, shortly expanded and a little reflexed throughout, whitish. Length 18, diam. 2½, longest axis of aperture 2 mm. (*Crosse*). *Mexico?*

Cylindrella swiftiana Crosse, Journ. de Conchyl., xi, 1863, p. 388; xv, 1867, p. 200, pl. 5, f. 5.—Fischer & Crosse, Miss. Scient. Mex., Moll., i, p. 407, pl. 17, f. 14.—Pfr., Monogr., vi, p. 370.—*Holospira swiftiana* Cr., Martens, Biologia, p. 284.

The internal column is unknown. It seems most closely related to *E. berendti,* but has more whorls and finer sculpture, is more slender, and the free portion of the last whorl is longer. Named in honor of Robert Swift.

E. gassiesi (Pfeiffer). Pl. 20, figs. 5, 6, 7.

Shell deeply and shortly rimate, fusiform-subulate, rather thin, very finely and densely hair-striate, whitish-corneous. Spire subulate, the apex entire, rather acute; suture simple. Whorls 17, a little convex, subequal, the last free in front, carinate above, slightly tapering downward and rounded at the base. Aperture slightly oblique, obliquely angular-oval; peristome continuous, very narrowly expanded throughout. Length 14, diam. 3 mm.; aperture 2½ mm. in oblique length (*Pfr.*).

Chiapas, Mexico (Bland).

Cylindrella gassiesi Pfr., Journ. de Conchyl., xv, 1867, p. 438; Monographia Hel. Viv., vi, p. 376.—Fischer & Crosse, Miss. Scient. Mex., Moll., i, p. 410, pl. 17, f. 17.—*Holospira gassiesi* Pfr., Martens, Biol., p. 283.

This species has fewer whorls than any of the genus except *E. berendti.* The internal axis has not been examined.

E. apiostoma (Pfeiffer). Pl. 20, figs. 12, 13, 14, 15.

Shell subrimate, subulate, subarcuately striatulate, diaphanous, whitish-corneous. Spire regularly tapering, the apex entire, rather acute. Whorls 22-24, a little convex, the last shortly protracted, angular above, more distinctly striate below. Aperture subvertical, obliquely pear-shaped; peristome white, somewhat reflexed throughout, the right margin somewhat sinuous above. Length 17, diam. 2⅓, oblique length of aperture 2 mm. (*Pfr.*).

Cordova, State of Vera Cruz (Sallé); *at the entrance of the cave of Cacahuatl* (Höge).

Cylindrella apiostoma Pfr., P. Z. S., 1856, p. 322; Conchyl. Cab., p. 32, pl. 8, f. 3-5; Monogr., iv, p. 703; vi, 376; viii, 435. —Fischer & Crosse, Miss. Scient. Mex., Moll., i, p. 406, pl. 17, f. 15.—Sowerby, Conch. Icon., xx, pl. 15, f. 129.—*Epirobia apiostoma* Pfr., Strebel, Beitrag, iv, p. 88, pl. 5, f. 6 (shell), pl. 13, f. 11 (genitalia).—*Holospira apiostoma* Pfr., Martens, Biologia, p. 283, pl. 17, f. 4.

Pfeiffer's description is given above. Strebel, who examined the types in Dohrn's collection, gives the length of one of them as 16.6, diam. 2.4, length of mouth 2.2 mm., whorls 23.

The specimen figured by Crosse and Fischer was a little smaller, as are several before me, received from Sallé, two of which measure:

Length 16, diam. hardly 2, longest axis of aperture 1.7 mm.; whorls 22.

Length 15½, diam. 2, longest axis of aperture 1.5 mm.; whorls 22.

However, Strebel's photographic figure of the Pfeifferian type gives a breadth of 2 with a length of 16½ mm., with the mouth certainly less than 2 mm.; so that it would seem certain that his published measurements are erroneous. Those of Pfeiffer, too, indicate diameter and length of mouth as too large for his own figures.

The apex, as in all the group, is obtuse, and usually a number of the early whorls are very pale colored, as though abandoned by the viscera. All the whorls are decidedly convex. The free portion of the last whorl is somewhat flattened on its outer and upper surfaces, producing a decidedly ovate or somewhat pear-shaped outline of the aperture, which is quite characteristic. The slender axial tube bears irregular oblique laminæ, some of which are smooth or nearly so, while others are coarsely serrate. In the last whorl there are only oblique white veins in the substance of the pillar (pl. 20, fig. 15).

E. polygyra (Pfeiffer). Pl. 20, figs. 11, 16, 17, 18, 19.

Shell deeply rimate, subulate, thin, fleshy-whitish. Surface lustreless, sculptured with arcuate, thread-like riblets separated by spaces of fully double their own width. Whorls

24 to 27, very convex, especially below the suture; the last shortly free in front, tapering to the rounded base. Aperture subvertical, rounded-ovate, the orifice pear-shaped; peristome rather broadly expanded, somewhat reflexed, much narrower and somewhat retracted at the upper outer angle.

Internal column slender, more or less swollen within each of the lower whorls, nearly cylindric above, the swollen portion roughened by acute granules, indistinctly arranged in descending series (pl. 20, fig. 11).

Length 19, diam. 2.5, longest axis of apert. 2 mm.; whorls 27.

Length 17, diam. 2.5, longest axis of apert. 2 mm.; whorls 25.

Cordova, State of Vera Cruz (Sallé).

Cylindrella polygyra Pfr., P. Z. S., 1856, p. 322; Conchyl. Cab., p. 31, pl. 8, f. 6-8; Monogr., iv, p. 704.—Fisch. & Crosse, Miss. Scient. Mex., Moll., p. 405, pl. 17, f. 16.—Sowerby, Conch. Icon., xx, pl. 7, f. 5.—*Epirobia polygyra* Pfr., Strebel, Beitrag, iv, p. 87, pl. 5, f. 7 *a*, b, pl. 13, f. 2 (radula), pl. 14, f. 14 (axis).—Pilsbry & Vanatta, Proc. A. N. S. Phila., 1898, p. 281, pl. 17, f. 2 (radula).—*Holospira polygyra* Pfr., Martens, Biologia, p. 284.

Larger than *E. apiostoma,* with more whorls, much more prominent thread-like striæ, and a more broadly expanded lip.

E. polygyrella (v. Martens). Pl. 20, figs. 8, 9, 10.

Shell subrimate, fusiform-subulate, closely arcuate costulate, opaque, fleshy-gray; spire regularly tapering, the apex rather large, entire. Whorls 22, convex, the diameter exceeding double the alt., the last moderately free, rounded. Aperture slightly oblique, obliquely pear-shaped, the peristome expanded throughout, whitish. Length 14, diam. 2¼, diam. of aperture 1½ mm. (*Mart.*).

The columellar axis is longitudinally costate, the costæ being partly divergent and partly forked above; the lower half within each whorl is not particularly swollen (fig. 8) (*v. Mart.*).

Northern Guatemala: *Coban, Vera Paz,* copiously (Salvin, Sarg. *et al.*).

Cylindrella polygyrella v. Mart., P. Z. S., 1863, p. 411; Jahrb. d. Malak. Ges., iii, 1876, p. 261, pl. 9, f. 8.—Pfr., Monogr., viii, p. 622.—*Holospira polygyrella* v. Mart., Biologia Centrali Americana, Moll., p. 284, pl. 17, f. 1, 1 *a, b.*—*Epirobia morini* Strebel, Beitrag, iv, p. 87, pl. 5, f. 3; pl. 13, f. 4 (radula); pl. 14, f. 15 a, b, c. Not *C. morini* Morelet.

"Distinct from the preceding by its smaller size (length 14, in one specimen 17 mm.), the more convex and broader whorls (the visible part of the lower whorls 2½ times as broad as high, instead of 1½-1⅔ times, as in *E. polygyra*), and the distinctly transverse, pear-shaped or triangular aperture" (*v. Mart.*).

Strebel has figured the internal pillar as more rugose than shown in v. Martens' figure. The teeth of the radula, as figured by Strebel, resemble those of *E. polygyra* in form.

Genus HOLOSPIRA von Martens, 1860.

Acera Albers, Die Heliceen, 1850, p. 209. Not *Akera* Müller, 1776, nor *Acera* Cuvier, 1810.—*Holospira* v. Martens in Alb., Die Hel., edit. 2, p. 39 (1860).—Crosse & Fischer, Journ. de Conchyl., 1870, p. 13; Miss. Scient. au Mex., Moll., i, p. 318.—Strebel, Beitrag Mex. Land- und Süsswasser-Conch., iv, p. 82 (1880).—Dall, Nautilus, ix, p. 50 (1895); Proc. U. S. Nat. Mus., xix, p. 346 (1897).—v. Martens, Biologia Centrali Amer., Moll., p. 273.

Shell small, *cylindric,* terminating above in a conic spire, *retaining all the whorls,* rimate or perforate. Whorls 11-21, *the first 1½ smooth,* the rest smooth, striate or ribbed, closely coiled, the suture superficial; last whorl more or less built forward. Aperture small, obliquely pear-shaped, rounded or oval, the peristome expanded or reflected, continuous and usually free throughout. *Internal column hollow,* variously sculptured or smooth. Type *H. pilocerei* Pfr. (*holos,* entire, and *speira,* spire).

Geographic range extending from southern Mexico to Texas, Arizona and New Mexico; but not reaching Lower California, or on the southeast, Guatemala. Confined chiefly to the elevated plateau, where they live under cacti, etc., in sunny places.

These snails can tolerate great heat. Living specimens of *H. strebeliana* and *H. nelsoni* sent me survived immersion in actually boiling water for some minutes. Unlike other snails, they did not retract in the water. They probably experience a high temperature in the exposed situations they inhabit.

The present genus was first indicated by Albers in 1850, as a section of *Cylindrella,* under the name *Acera.* This name being preoccupied, Prof. E. von Martens in 1860 replaced it by the appropriate term *Holospira,* 'entire spire,' alluding to the retention of the early whorls in this series, while they are generally lost in other members of the family. He included with them some species now referred to *Epirobia.* The group was elevated to generic rank by MM. Crosse & Fischer in 1870, and we owe to these authors the first information upon jaw and teeth, and the observation that the axis is a hollow tube, as in *Cœlocentrum.*

In 1865 Thomas Bland had recorded the presence of lamellæ within the penultimate whorl of *H. goldfussi,* but no taxonomic use was made of this fact until the genus passed under the penetrating eye of Hermann Strebel, 1880. This able observer was apparently the first who was not deterred from cutting shells by the fear of injuring "specimens." His genius for taxonomy grasped the value of the internal characters in classification, and upon these characters he based the new groups *Metastoma, Bostrichocentrum* and *Holospira* in a restricted sense. Prof. William H. Dall (1895) amplified the classification along the lines initiated by Strebel; and although there has been a considerable increase in the number of species since his classification was proposed, no material change therein, further than the restriction of *Metastoma* to its original limits, has been made in the present work, further research confirming his conclusions.

The monographs of Crosse (*Journal de Conchyliologie,* 1892) and of von Martens (*Biologia Centrali Americana,* 1897) practically ignore internal characters. Though later in date, they are to be classed with the work preceding Strebel.

Many species doubtless remain to be found. The list given by Crosse & Fischer in 1873 contains 13; Stearns, 1890, has

16; Crosse, 1892, 16 species; Dall, 1895, 22 species; von Martens, 1897, has 12 species (those from the United States being omitted). The present work describes 28 species.

Most of the forms are known from the type localities only; and while the range of many of them will doubtless be extended by further collections, it is obvious that they are much more restricted in habitat than most of the land snails of other families inhabiting the same regions. Though usually occurring in abundance where found, they seem to be exceedingly local.

The only fossil species referable to this genus is the Puerco (lower Eocene) *Holospira leidyi* (*Pupa leidyi* MEEK, Sixth Ann. Rep. U. S. Geol. Surv. of the Terr. for 1872, p. 517; 1873. WHITE, Bull. U. S. Geol. Survey no. 34, p. 27, pl. 5, f. 8, 9, 10; 1886), from near the town of Nacimiento, New Mexico, and also from the base of the Bridger or top of the Green River Group, 12 miles south of Fort Bridger, Wyoming. While not absolutely conclusive, this species seems to have all the features of *Holospira,* as Meek himself suspected. In New Mexico it occurs with *Helix nacimientensis* White, a form apparently referable to the Mexican genus *Lysinoe*, judging by the size, the circumumbilical angle, etc.

Soft Anatomy of Holospira.

The foot is small, narrow for its length, and in *H. roemeri, dalli, strebeliana* and *nelsoni* the sole is undivided. In several dried specimens of *H. goldfussi* Strebel discerned a very narrow median band. The tail is depressed; upper surface granulose, with a prominent row of granules along the margins in *H. goldfussi* (pl. 19, fig. 54) according to Strebel. In the other species examined this is hardly noticeable (pl. 15, fig. 14, *H. elizabethæ*). At the angle of the mantle there are small right and left neck-processes in all the species examined (pl. 19, fig. 51, *H. goldfussi*).

Pallial organs. The lung is long and narrow. Kidney very narrowly triangular, being wider at the base, tapering anteriorly, slightly longer than the pericardium (pl. 27, fig. 37, *H. dalli* x 4). There is apparently no secondary ureter.

Alimentary tract. The buccal mass is small, about twice as long as wide, the œsophagus opening well forward. Salivary glands not united, in *H. roemeri* rather short, and on short ducts (pl. 27, fig. 39). In *H. goldfussi* the ducts are long, according to Strebel. The fore-gut in *H. roemeri* (pl. 27, fig. 39) is slender, dark-colored, and follows the pharyngeal retractor, lying thus near the central pillar of the shell. Posteriorly it dilates into the stomach, which fills the greater part of the upper whorl of the cylindrical portion of the shell, and is copiously black-pigmented on its peripheral surface. The hind-gut revolves at the suture, and is white. I could make out but two longitudinal folds of the whole intestine, but from the constancy of the four-folded type, and its distinct development in *Urocoptis* (*q. v.*), I may have overlooked a small fold. Unfortunately I have no material in condition to make another examination. The liver occupies all the whorls of the cone.

The jaw is thin, arcuate, with a wide median projection below or none. It is smooth in *H. roemeri* (pl. 27, fig. 38) and *H. nelsoni* (pl. 27, fig. 40), irregularly, very finely striate vertically in *H. dalli* (pl. 27, fig. 42). In *H. pilsbryi* (pl. 27, fig. 41) there are diverging, unequally spaced striæ. In *H. goldfussi* there are distinct plates towards the edges, and elsewhere a rather irregular somewhat scaly sculpture (pl. 19, fig. 50, after Strebel). It varies therefore from the smooth, through striated almost to the plaited type.

The radula is about four times as long as wide, with from 19.1.19 teeth (in *H. pilsbryi*) to 27.1.27 (in *H. nelsoni*). The transverse rows are nearly straight in the middle, bending forward at the two ends. It has been examined in *H. goldfussi* (Binney, Strebel), *H. tryoni* and *"pfeifferi"* (= *minima*) (Fischer), and in *H. nelsoni, pilsbryi, roemeri, elizabethæ* and *dalli* by myself. In the species of typical *Holospira* the teeth are more numerous, 17.9.1.9.17 = 53 in *goldfussi,* 19.8.1.8.19 = 55 in *nelsoni;* the cusps are rather short, conic, and those of the outer lateral teeth are not split, there being but two (pl. 50, fig. 4, *H. goldfussi,* after Binney). In all the other species examined the teeth are of substantially the same type, varying in the length of the cusps in the several

forms. The central and lateral teeth have single, stout, conic cusps. The transition to marginals is made by the gradual development of an ectocone, at first small and simple, and in the usual position. The outer marginal teeth are short, wide and usually have both cusps bifid, or the outermost ones may be irregularly cusped. The count of teeth is less than in typical *Holospira,* as follows: *H.* (*Bostrichocentrum*) *tryoni* 13.7.1.7.13 = 41; *H.* (*B.*) *pilsbryi* (pl. 50, fig. 5) 13.6.1.6.13 = 39; *H.* (*Haplocion*) *minima* 17.6.1.6.17 = 47; *H.* (*Metastoma*) *roemeri* 13.7.1.7.13 = 41; *H.* (*Cœlostemma*) *dalli* 13.8.1.8.13 = 43; *H.* (*C.*) *elizabethæ* has 8 or 9 unicuspid laterals.

In *H. goldfussi,* Strebel & Pfeffer found a type of radula quite unlike those examined by Fischer or myself, and differing widely from what Binney figured for the same species. They describe the central and lateral teeth as with ectocones wholly separated from the cusp, and concrescent with the basal-plate of the next older tooth. The main cusps are very short and broad, etc. This differs so radically from what has been observed in other species that I am compelled to believe that some mistake in the identity of the radula was made. Indeed I believe that Strebel got the radulæ of *Epirobia berendti* and *Holospira goldfussi* transposed, and figured the one for the other. The forms of the individual teeth and the formula given for a transverse row point significantly to this conclusion.

The genital system of *H. goldfussi* (pl. 19, fig. 52) has been examined by Strebel & Pfeffer; of *H. nelsoni* (pl. 27, figs. 33, 34), *H.* (*Metastoma*) *roemeri* (pl. 27, fig. 36), *H.* (*Cœlostemma*) *dalli* (pl. 27, fig. 35) by myself. In all of them there is an atrium of moderate length; the penis is short, with a very long vas deferens; the retractor musele (*p. r.*) being inserted at or just beyond the slightly swollen penis, and proximally attached to the floor of the lung, as usual. In *H. nelsoni* there are internal folds in the penis, showing through. There are no accessory organs. The spermatheca and oviduct are separate to the atrium in the species I have opened, but in *H. goldfussi,* Strebel figures a capacious vagina. The oviduct is ex-

tremely long, the albumen gland small, lying in the volution anterior to that containing the stomach (in *H. roemeri*). The ovisperm duct is strongly convoluted but not knotted in appearance. The spermatheca is small and ovate, on a duct as long as the oviduct. This duct is simple in *H. goldfussi, dalli* and *roemeri,* but certainly bears a long diverticulum in *H. nelsoni* (pl. 27, fig. 33).

The free retractor muscles are excessively long, attached proximally to the axis at about the junction of the cone with the cylindrical portion of the shell. In *H. roemeri* (pl. 27, fig. 43, x 5) the left ocular retractor unites with the pharyngeal retractor at about the posterior third of the length of the latter. This band then unites with the columellar muscle near its posterior insertion. The right eye-retractor unites with the columellar muscle at about the anterior third of the length of the latter. Both ocular retractors give off some short anterior pedal branches distally. The pharyngeal retractor is not split at its distal insertion.

In *H. goldfussi* Strebel found a somewhat different arrangement (pl. 19, fig. 53). The columellar and pharyngeal bands are united for a greater distance posteriorly, and the latter divides into four branches at about the same place: right and left ocular, pharyngeal, and a median band inserted in the integument below the mouth. This differs so radically from the condition found in *H. roemeri* that it may be due to an error of observation, the more likely because Strebel worked from dried specimens which he soaked up.

Key to Subgenera and Sections of Holospira.

I. Internal column with a spiral lamella within the penultimate whorl, sometimes with parietal, basal and peripheral lamellæ also. Whorls 11 to 17.

Subgenus Holospira s. str.

a. Cavity of the penultimate whorl obstructed by four lamellæ, axial, parietal, basal and peripheral, the last sometimes wanting.

Sect. *Holospira,* species 1-6.

b. Penult. whorl with a short axial and a parietal lamella only. Sect. *Eudistemma,* sp. no. 7.

c. Penult. whorl with a short axial and a basal lamella only. Sect. *Distomospira,* sp. no. 8.

d. Penult. whorl with a short axial lamella only. Sect. *Haplostemma,* sp. no. 12, 13.

e. A low plait or spiral swelling extending throughout the cylindrical portion of the shell, a short lamella superposed upon it in the penultimate whorl. Sect. *Bostrichocentrum,* sp. no. 9-11.

II. Internal column smooth; interior without lamellæ or plaits of any kind; last whorl normal, straightened anteriorly; aperture without folds or other obstruction. Whorls 11 to 19. Subgenus Haplocion, sp. no. 14-20.

III. Internal column smooth; interior without lamellæ; last whorl sinuous, turning sinistrally; aperture oblong, with a strong fold within the right margin and a columellar callus in the throat. Whorls 12 to 14. Subgenus Metastoma, sp. no. 21.

IV. Internal column vertically ribbed, large. Whorls narrow and numerous (17-21); terminal cone short. Subgenus Coelostemma, sp. no. 22-24.

V. Internal structure unknown. Species no. 25-28.

Subgenus Holospira s. str.

Internal column bearing a spiral lamella or plait within the penultimate whorl, or with additional lamellæ upon the roof, floor or outer wall of the same whorl.

This is the most numerous subgenus in species, but all of the forms seem from present data to be excessively restricted in distribution.

Section *Holospira.*

Cavity of the penultimate whorl obstructed by four spiral lamellæ, none of them exceeding a whorl in length: a columellar lamella, a large (parietal) lamella on the roof of the whorl, a smaller (basal) one on the floor of the whorl, and a palatal plait, usually the smallest and sometimes wanting, on the outer wall. Teeth of the radula more numerous than in other sections of the genus. Type *H. pilocerci.*

Six species with the structure of this group are now known

more or less perfectly. With the exception of *H. goldfussi* all are species of great rarity. Another form, *H. teres* Mke. (sp. no. 28), unknown internally, may prove to belong to this group. All of them are much alike in the internal armature. They may be briefly diagnosed as follows:

H. tetrelasmus: Length 13.8-14.8, diam. 4.5-4.6 mm., being thus about 3 times as long as wide; whorls 12½-13½, sculptured with white or whitish riblets on a fleshy ground, the top and base opaque white. The columellar lamella runs nearly or quite to the mouth. Mexico.

H. pilocerei: Length 14, diam. 3⅓ mm., being about 4 times as long as wide; whorls 15, finely striate, the last rugulose, protracted. Interior unknown. Mexico.

H. goldfussi: Length 11-15, diam. 3.5-3.6 mm.; whorls 12-14½, rather strongly ribbed, the ribs the same color as the dull fleshy intervals. Internal column cylindrical, not wider above; columellar lamella barely entering the last whorl. Texas.

H. goniostoma: Length 15, diam. 3.7, the length about 4 times the diameter; whorls 15-16, sculptured with fine white riblets. Internal column decidedly wider above; columellar lamella obsolete in the last whorl. Mexico.

H. pfeifferi: Length 15.5-17.5, diam. 5-5.6 mm., about 3 times as long as wide; whorls 12, very finely sharply ribbed. Palatal lamella wanting, basal lamella small. Tehuacan, State of Puebla.

H. nelsoni: Length 16-17.4, diam. 4.7-4.5 mm., whorls 15½. White, with blue stains and flecks, the early whorls fleshy-brown; slowly tapering, more rapidly near the apex, where it is sharply, finely striate, the following whorls obsoletely ribbed, last whorl finely and distinctly ribbed; ribs and intervals of the same color. Internal column small, cylindrical, of about equal width above and below. Guadalupe Mts., Mexico.

1. H. TETRELASMUS n. n. Pl. 21, figs. 23-27.

This species shows externally some resemblance to *H. tryoni,* but the shell terminates in a longer cone above, and the chalky white color is confined to the upper and lower portions, while

the median whorls are more flesh-colored, or have a violet shade. The white and opaque embryonic whorls are smooth, then fine, sharp riblets appear, which gradually pass into coarse, closely-placed and very obtuse riblets, which are relieved against the background by their intensely white or at least lighter color, and stand alone or are coalescent. Upon the last whorl these riblets become again sharper, that is, more raised. The whorls, though flatly convex, project a little at the suture, so that it is impressed. The last whorl is somewhat compressed around the very narrow umbilical chink, laterally flattened near the aperture, not free for very long, and provided with a wide, calloused sutural keel above, which corresponds to a wide channel in the aperture. The end of the columellar lamella is visible more or less distinctly upon the inconspicuous somewhat oblique, deep-seated columellar fold. The columellar lamella revolves around the internal column in the last whorl, increases rapidly and then decreases, and at its largest projects rather far in the lumen of the whorl. The parietal lamella does not hang vertically, but its lower edge flares outwards somewhat; it increases slowly in size and then diminishes rapidly. The basal lamella is very short, callous, and strongest at the end. The palatal fold is still shorter and weakly developed, and is not visible through the shell from the outside. The interior is here ochre-yellow, while the inside of the mouth is white.

Length 13.8, diam. 4.5, alt. apert. 3.3, width 3.5 mm.; whorls 12¼.

Length 14.8, diam. 4.6, alt. apert. 3.5, width 3.4 mm.; whorls 13¼. *Mexico* (Liebmann).

Cylindrella pilocerei Pfr., Monogr., ii, p. 382; iii, 579; iv, 710; vi, 389; Conchyl. Cab., p. 61, pl. 6, f. 32, 33.—Philippi, Abbild. u. Beschreib., iii, p. 5, pl. 3, f. 7, 8.—*Holospira pilocerei* Pfr., Fischer & Crosse, Miss. Scient. Mex., Moll., i, p. 329, pl. 17, f. 5.—Strebel, Beitrag, iv, p. 82, pl. 5, f. 1.—Crosse, Journ. de Conchyl., xl, 1892, p. 265, pl. 5, f. 3, 3 *a*, and var. B, p. 266, pl. 5, f. 4, 4 *a*.—Martens, Biologia, p. 278. In all cases exclusive of references to Pfeiffer's Symbolæ and Philippi's Abbild., i. Not *C. pilocerei* Pfr., 1841.

The above description and figures 26, 27 are taken from Strebel, who described and illustrated specimens bearing Pfeiffer's label, *C. Pilocerei,* from the Pfeiffer-Dohrn collection. Figs. 23-25 are from Philippi, representing specimens collected by Liebmann, as were those of Pfeiffer.

It is a less slender shell than the original *pilocerei,* with a shorter neck and less triangular aperture.

H. tetraclasmus resembles *H. tryoni* externally, but is not so smooth and the whorls are less narrow.

Crosse has described a variety a little smaller than the type, with 12 whorls, the last not detached. Length 11, diam. 4 mm. (pl. 21, figs. 28, 29). The internal characters of this variety are not known.

2. H. PILOCEREI (Pfeiffer). Pl. 22, figs. 45-48.

Shell cylindrical, the apex conic, not truncate; whitish; longitudinally very delicately striate; whorls 15, slightly convex, the last rugulose, protracted, carinated above; aperture spreading, pear-shaped. Length 7, diam. 1⅔ lines [about 14, 3⅓ mm.] (*Pfr.*).

Cuautla de las Amilpas [in Puebla or Moreles], Mexico (Hegewisch), on the cactus *Pilocereus senilis.*

Cylindrella piloeerei PFR., Symbolæ ad Hist. Heliceorum, p. 47 (1841), and in PHILIPPI, Abbild. u. Beschreib, i, p. 183, pl. 1, f. 7 (Dec., 1844).

"I received for determination the single figured specimen from the late Hegewisch, and the species is to be found in no collection known to me. It is principally distinguished by the blunt, conic apex, and by the horizontal free deviation of the last whorl, which is carinated not at the base, but on the back." (*Pfr.*)

The original description and copies of Philippi's figure of the unique type specimen are given above. They indicate a shell more slender than the "*H. pilocerei*" of later authors, with the last whorl more produced and the aperture shaped much as in *H. goldfussi.* The internal structure is unknown, and no specimen other than the single original type is on record.

3. H. GOLDFUSSI (Menke). Pl. 21, figs. 30-35.

Shell rimate or perforate, cylindric with a rather long, gradually tapering terminal cone, dull flesh tinted. Surface lustreless, sculptured with strong riblets, which are decidedly arcuate on the lower whorls, straighter and more oblique above; the nepionic 2¼ whorls smooth. Whorls 11½ to 14½, the first two very convex, following whorls convex, the last somewhat flattened laterally near the aperture, rounded below, shortly free and produced forward. The upper surface flattened and even concave, a strong, blunt keel at its junction with the outer face of the whorl. Aperture rounded below, truncate above, the peristome white, reflexed throughout, a low prominence of the horizontal parietal margin projecting inward near the outer angle of the aperture, which is thereby somewhat spout-like.

The internal column is rather small and cylindrical, of about equal calibre from the penultimate whorl to near the apex. About 4 whorls from the last there arises a slight spirally running swelling near the anterior partition in each whorl. In the beginning of the penultimate whorl a strong lamella is superposed upon this swelling, and runs 1½ whorls down; it increases rapidly, and diminishes slowly below, continuing but a little way in the last whorl. A strong, wide, outward-flaring parietal lamella arises with the columellar lamella, and runs about ¾ of a whorl. A short basal lamella arises a little later than the preceding two, and extends about one-fourth of a whorl downward. An acute but rather low palatal lamella arises with the last, and runs about ½ of a whorl. In fresh specimens this is visible from the outside as a whitish line on the front of the penultimate whorl.

Length 15, diam. 3.6 mm.; whorls 14½.

Length 14, diam. 4 mm.; whorls 14.

Length 11½, diam. 4 mm.; whorls 12.

Length 11, diam. 3½ mm.; whorls 12.

Texas: On the Blanco River (B. F. Shumard); New Braunfels, Comal Co. (J. A. Singley); Dallas (J. Boll).

Cylindrella goldfussi MENKE, Zeitschr. f. Malak., 1847, p. 2.—PHILIPPI, Abbild. u. Beschreib., iii, p. 6, pl. 3, f. 9.—

PFEIFFER, Conchyl. Cab., p. 61, pl. 7, f. 1-3; Monogr., ii, p. 383; iii, 579; iv, 710; vi, 389.—BLAND, Ann. Lyc. Nat. Hist. of N. Y., viii, p. 160.—W. G. BINNEY, Terrestr. Moll., iv, p. 151, pl. 79, f. 33; Land and Fresh-water Shells of N. A. (Smithsonian Misc. Coll., no. 194), p. 24, f. 19.—*Holospira goldfussi* Mke., TRYON, Amer. Journ. of Conch., iii, pl. 15, f. 31, and reprint of same, Monogr. Terrestr. Moll. U. S., p. 140, pl. 15, f. 31.—W. G. BINNEY, Terr. Moll., v, p. 177, f. 86; pl. iv, f. N (radula); Man. Amer. Land Shells, p. 422, f. 468, 466.—STREBEL, Beitrag, iv, p. 83, pl. 5, f. 2; pl. 14, f. 17 A, B (shell); pl. 13, f. 3, 5, and pl. 15, f. 2 A-E (anatomy).

The shell varies a good deal in size and shape. Some specimens are almost exactly cylindric, while others are distinctly swollen above. There is a tendency for the whorls to overhang the suture in some specimens. The internal lamellæ vary somewhat in position, but the palatal thread always lies within the front or ventral part of the penultimate volution.

The locality, Dallas, given by Strebel on the authority of Boll, is far to the north of the other localities, which lie in adjacent counties south of the middle of the State. If correct this is the most northern locality for *Holospira*. Menke's types may have come from New Braunfels, an old German colony. They were collected in Texas by G. A. Goldfuss, in whose honor the species was named. The figures are from New Braunfels specimens.

4. H. GONIOSTOMA (Pfeiffer). Pl. 21, figs. 36-41.

Shell rimate, cylindric, rather solid, rather closely arcuate-costate; brown-flesh colored; spire long, terminating in a rather short cone. Whorls 15, rather flat, the upper corneous and smooth, the last shortly free, produced forward, obsoletely angular above and at the base. Aperture vertical, obliquely angular-oval; peristome white, free and shortly expanded throughout. Length 15, diam. 3⅔, oblique length of aperture 2⅔ mm. (*Pfr.*).

Mexico (Mus. Cuming, Pfr.; also Uhde).

Cylindrella goniostoma PFR., Malak. Blätt., iii, 1856, p. 47; Conchyl. Cab., p. 63, pl. 7, f. 7-9; Monogr., iv, p. 710.—v.

Mart., Malak. Blätt., xii, 1865, p. 15.—Not *C. goniostoma* Sowerby, Conch. Icon., xx, pl. 8, f. 72.—*Holospira goniostoma* Fisch. & Crosse, Miss. Scient. Mex., Moll., i, p. 328, pl. 17, f. 4.—Strebel, Beitrag, iv, p. 84, pl. 14, f. 6 a, b. c (axis).—Crosse, Journ. de Conchyl., xl, 1892, p. 264.—v. Mart., Biologia, Moll., p. 280.

Strebel's figures of the shell (fig. 37), the internal column (fig. 38) and the lamellæ (fig. 36) are reproduced on my plate. He writes: The shell is rather lengthened, cylindric, rather translucent, brownish-horn colored, lighter and becoming somewhat whitish below, and set with fine, sharp, pretty closely placed and somewhat oblique ribs, distinctly white and continuing to the suture. On the upper half of the shell they are rather straight, on the lower half somewhat curved, corresponding to the flatness of the upper, and the greater convexity of the lower whorls. The embryonic whorls are smooth and brownish horn-colored, placed somewhat obliquely and button-like; the following whorls increase very slowly in height, are separated by a deep suture. The last whorl is compressed, feebly angular at the base, the free portion pretty long, as it has been already described. The umbilicus is closed. The internal column (fig. 38) is rather conspicuously widened above the middle, narrowing again towards the apex; below it is rather narrow as a whole, and besides the dilation, in each whorl, shows a dilation running spirally, which towards the lower whorls is more and more thickened into a lamella, which finally projects rather broadly into the whorl, then in the last whorl rapidly diminishes again, and does not reach to the aperture, where there is visible only a somewhat oblique, indistinct, columellar fold. The three characteristic lamellæ in the interior of the last whorl have the following disposition: The largest, cord-like, depends from the partition between the whorls, begins in the third whorl from the mouth, and runs to almost the beginning of the last whorl. It increases in height gradually, and diminishes more rapidly. The second (basal) lamella runs between the penultimate and last whorls, but is only a half whorl in length. It is more calloused, and only towards the end on the outer side projects

cord-like. The third lamella, running on the inside of the outer wall of the penultimate whorl, is a rather low, narrow and short callus, showing through distinctly from the outside. All three lamellæ are glossy white (fig. 36). Strebel gives the length of a specimen from Cuming as 15.7 mm., whorls 16.

Von Martens remarks that the specimen taken by Uhde "is very much shorter (length 12 mm.) than that of Cuming, and it has only 14 instead of 15-16 whorls; but in the diameter of the whole shell and in the size of the aperture they are alike. All are probably from central Mexico."

5. H. NELSONI Pilsbry, n. sp. Pl. 22, figs. 42, 43, 44.

Shell rimate, cylindric-tapering, the cylindric lower portion passing imperceptibly into the tapering upper half; thin but moderately solid; white, more or less extensively stained with blue, and with streaks and dots of blue or dark flesh-color, the intervals between the white riblets on the base and several early whorls being brownish flesh-colored. Whorls 15½, the first two smooth, following 5 or 6 closely and sharply striated obliquely, this sculpture then becoming more obtuse, changing to very low, rather coarse riblets, more or less obsolete in places, and usually so in the middle of each whorl; on the last whorl these riblets become narrower, stronger and closer, on its latter half still closer and sharper; and they extend over the convex basal. The last whorl is very shortly produced forward, flattened above, angular outwardly. Aperture vertical, obliquely rounded-piriform, contracted and angular at the upper external extremity, the margins straightened on each side of the angle, elsewhere arcuate; peristome white, expanded and somewhat thickened. Interior brown. Internal pillar small, of about equal size above and below, the lumen of the penultimate whorl contracted by four lamellæ: a strong, thick-edged axial lamella, not over one whorl long, and barely entering the last whorl; a larger lamella on the parietal wall, arising rather suddenly and decreasing gradually, nearly one whorl in length, about half of this being in the antepenult. whorl; a low palatal fold about ⅓ whorl long on

the outer wall below its middle; and a basal lamella about a half whorl in length; this and the palatal fold standing on the ventral side in the individual opened.

Length 17.4, diam. 4.7, longest axis of aperture 3.7 mm.

Length 17, diam. 4.5, longest axis of aperture 3.8 mm.

Length 16, diam. 4.7, longest axis of aperture 3.7 mm.

Mexico: *Sierra Guadalupe,* 6500 ft. elevation (E. W. Nelson).

This species resembles *H. teres* Mke. in contour, and when the interior of that species is investigated it may prove to be a variety thereof. However, with a somewhat smaller size, *H. nelsoni* has more whorls, and the coloration differs. In *H. goniostoma* the internal column is wider above, and the sculpture apparently finer and more distinct. It does not seem closely related to any other described species. Occurred with *H. dalli* and *H. strebeli.*

6. H. PFEIFFERI (Menke). Pl. 22, figs. 49, 50, 51.

Shell ovate-oblong, subfusiform, swollen from the middle downwards; apex conic, entire, a little obtuse; rimate, thin, pellucid, pale yellowish, densely and very finely lamellose-ribbed. Whorls 12, a little convex, the last not drawn out, adnate posteriorly. Aperture rounded, the peristome continuous and reflexed. Length 7.6, diam. 2.5 lines [about 15.4, 5 mm.] (*Mke.*).

Mexico: Tehuacan, in the State of Puebla (Liebmann).

Cylindrella pfeifferi MENKE, Zeitschr. f. Malak., 1847, p. 1; PHILIPPI, Abbild. u. Beschreib., iii, p. 6, pl. 3, f. 4.—PFR., Monogr., ii. p. 382; Conchyl. Cab., p. 60, pl. 6, f. 30, 31.—*Holospira pfeifferi* Mke., TRYON, Amer. Journ. of Conch., iii, p. 313, pl. 15, f. 34 (but not the locality); Monogr. Terr. Moll. U. S., p. 140, pl. 15, f. 34.—FISCH. & CROSSE, Miss. Scient. Mex., Moll., i, p. 323 (exclusive of var. *b*).—STREBEL, Beitrag, iv, p. 84, pl. 13, f. 12.—v. MART., Biologia, p. 280, exclusive of varieties.—CROSSE, Journ. de Conchyl., xl, 1892, p. 260 (exclusive of var., p. 261, pl. 5, f. 7, 7 *a*).

Pfeiffer, whose material was evidently part of the original lot from Liebmann, gives the dimensions as length 17½, diam. in the middle 5⅔ mm., the aperture 4 mm. long, 4½ wide, whorls 12.

Strebel and Pfeffer examined a somewhat defective specimen without exact locality, from the Berlin Museum. The sculpture consists of sharply developed, pretty close, fine riblets, but little curved, which on the last whorl are more separated and coarser. The internal axis is similar to the preceding species, but the palatal lamella (upon the inside of the outer wall) is wanting, that upon the basal wall is reduced to a callus, and the parietal one is normal. The specimen measures, length about 16.5, diam. 5.7, whorls 12. Possibly the condition of the internal lamellæ may be due to immaturity.

Tryon's description of this species, alluded to above, was contracted, with liberties, from that of Pfeiffer, and his figure is a bad copy of one in the Conchylien Cabinet. The specimens before him from Sonora, which he gives as the locality, belong to another species, *H. minima.*

Section *Eudistemma* Dall, 1895.

Dall, Nautilus, ix, p. 50 (Sept., 1895); Proc. U. S. Nat. Mus., xviii, p. 3 (1895); xix, p. 346 (1897).

"Penultimate whorl with a short axial and a parietal lamella only, the axis moderately large. Type *H. arizonensis* Stearns."

7. H. arizonensis Stearns. Pl. 16, figs. 1, 2.

Shell dextral, elongately cylindrical, fusiform, dingy white to pale horn color, translucent. Number of whorls 12-13, slightly convex, the sutures distinctly defined. The upper 6 or 7 whorls rather abruptly tapering towards the obtuse apex, which has a slightly twisted and rather a papillose aspect. The last whorl is curved under and constricted back of the mouth, forming an umbilical notch. The apex and following whorl are smooth; the three or four succeeding whorls sharply and somewhat obliquely plicated longitudinally, the median and following whorls becoming somewhat obscurely sculptured other than by distinct growth lines. The basal whorl is strongly sculptured below, and back of the mouth, and obtusely angulated underneath. Aperture ovate, slightly angulated anteriorly, somewhat effuse, rimmed and projecting.

Length 12.5, diam. 4 mm.; length 13, diam. 4 mm. (*Stearns*).

Arizona: Dos Cabezas. Two specimens and numerous fragments were found in a cave in November, 1889, by V. Bailey, U. S. National Museum, no. 104392.

Holospira arizonensis Stearns, Proc. U. S. Nat. Mus., xiii, 1890, p. 208, pl. 15, f. 2, 3; xiv, 1891, p. 100.—*H.* (*Eudistemma*) *arizonensis* Stearns, Dall, Nautilus, ix, p. 50.

About the size and figure of *H. remondi,* but differing from all other known species in the internal armature.

Section *Distomospira* Dall, 1895.

Dall, Nautilus, ix, p. 50 (Sept., 1895); Proc. U. S. Nat. Mus., xviii, p. 3; xix, p. 346.

Penultimate whorl with a short, stout lamella on the axis and a weaker basal lamella only; axis otherwise smooth, moderately large and cylindrical. Type *H. bilamellata* Dall (*Distomospira,* spire with two apertures, i. e., divided into two cavities).

8. H. bilamellata Dall. Pl. 16, figs. 5, 10, 11.

Shell elongate, slender, blunt-tipped, with two smooth nuclear and 15 subsequent whorls; the spire increases evenly to the eighth whorl and then very slowly attenuate; sculpture of slightly oblique, little raised, nearly straight riblets with doubly wide interspaces marked by somewhat irregular lines of growth; the sculpture between the ninth and the last whorl is more or less obsolete, but on the last whorl is strong, crowded, and a little irregular; suture distinct; base a little appressed; umbilical chink small; aperture as in *H. crossei,* but projecting beyond the periphery of the last whorl. Length of shell 20.5, maximum diameter 5 mm. (*Dall.*)

New Mexico: *top of Hachita Grande Mountain,* Grant Co. (Dr. Mearns); with *H. crossei,* not uncommon; no. 129990, U. S. N. M.

Holospira (*Distomospira*) *bilamellata* Dall, Proc. U. S. Nat. Mus., xviii, p. 4 (1895); xix, p. 349, pl. 31, f. 3 (1896).

This species in form recalls *H. semisculpta* Stearns, but is smaller, without the polished surface of the latter and of a ferruginous white instead of the bluish color of *H. semi-*

sculpta. The aperture in some specimens projected more than in others which seemed fully adult. The internal armature consists of a short very wide flange near the base on the pillar and a low but strong basal ridge extending about one-third of a gyration slightly nearer the inner than the outer wall of the whorls (*Dall.*)

The internal pillar is about 1 mm. in diameter, of about equal calibre throughout except in the earliest and last whorls, and as usual in *Holospira,* shows fine whitish lines on a gray-white surface (*bilamellatus,* having two plates).

Section *Bostrichocentrum* Strebel.

Strebel, Beitrag zur Kenntniss der Fauna Mexikanischer Land- und Süsswasser-Conchylien, iv, p. 80, for *B. tryoni* Pfr.

This group is characterized by the spiral lamella situated low upon the axial column within the penultimate whorl. There is also a low ridge or inflation spirally ascending the column, which is not enlarged above. No other lamella or folds exist. (*Bostrychos,* curl, and *kentron,* center).

Three species with this structure are known: *H. tryoni,* with 11-15 narrow, closely coiled whorls, and measuring, length, 13.5, diam. 4.5 mm., to length 9.7, diam. 4 mm.; *H. veracruziana,* with 17 whorls, length 17.5, diam. 5 mm.; *H. pilsbryi,* with 12-14 whorls, length 10.25-13 mm.; the whorls higher and the shell more slender than *H. tryoni.*

9. H. tryoni (Pfeiffer). Pl. 22, figs. 52-58.

Shell perforate and rimate, cylindrical, conic above, thin but moderately solid, opaque white, sometimes a little stained with brownish flesh-color, the cone usually brownish. First 1½ whorls smooth; following whorls densely, sharply and finely striate; this sculpture continuing on the cylindrical portion, but on the lower half becoming coarser and less sharp, or irregular and almost obsolete, the last several whorls being nearly smooth. Whorls 11 to 15, somewhat convex, *very narrow and closely coiled,* 6 to 8 in the cylindrical portion, those above forming a rather short cone, the

apical whorls rounded, a little projecting, nipple-like. The last whorl is rounded below, and not produced forward, though the peristome is usually free. Aperture subcircular, vertical, peristome continuous, expanded and slightly reflected, rarely adnate above. The internal axis (fig. 57) is about one-fifth the diam. of shell, pillar-like, of about equal diameter above and below. It is encircled by a slight ridge or convexity, which revolves below the middle in each whorl, throughout the cylindrical portion of the shell, though weak in the intermediate whorls. In the penultimate whorl a callous cord is superposed upon this ridge, producing an obtuse lamella about one whorl long, extending into the last whorl but not reaching the aperture. The pillar is otherwise smooth, showing some fine longitudinal white lines on a bluish-white ground.

Length 13, diam. 4.2 mm.; whorls 14⅓.

Length 11½, diam. 4.4 mm.; whorls 12¾.

Length 13½, diam. 4.5 mm.; whorls 15 (Pfr. type).

Length 10, diam. 3.8 mm.; whorls 12¼.

Length 9.7, diam. 4 mm.; whorls 11⅓.

Puebla (Pfr.): *Matamoras Izucar,* in the State of Puebla, on cactus (Boucard).

Cylindrella tryoni Pfr., Journ de Conchyl., xv, 1867, p. 438; Novit. Conch., p. 433, pl. 97, f. 5-7; Monogr., vi, p. 390; viii, 447.—*Holospira tryoni* Pfr., C. & F., Journ de Conch., 1870, pp. 14, 24, pl. 5, f. 5 (jaw); Miss. Scient. Mex., Moll., i, p. 331, pl. 17, f. 6; with var. *appressa.*—v. Martens, Biologia, p. 276.—*Bostrichocentrum tryoni* Pfr., Strebel, Beitrag, iv, p. 81, pl. 5, f. 3; pl. 14, f. 13, 16 a, b.—?*Holospira gealei* H. Ad., Fisch. & Crosse, Miss. Scient., Moll., i, p. 333, pl. 17, f. 7.—Crosse, J. de C., xl, 1892, p. 271, pl. 5, f. 2.—*H. tryoni* Crosse, Journ. de Conch., xl, 1892, p. 267, pl. 5, f. 5, 5 *a.*

A very compactly coiled shell, with narrow whorls. It varies from a quite cylindrical contour to one in which the shell is slightly wider above than below. The supposed variety *appressa* is merely an individual variation, the peristome being adnate above, as in my fig. 56. The series be-

fore me confirms the wide variation in shape recorded by Strebel. Figs. 52, 53 are copied from Pfeiffer's original illustration; figs. 54, 55 are those of Strebel, double natural size; while figs. 56-58 are from specimens in the museum of the Academy. I have found the internal structure the same in the shortest and longest specimens. Named for George W. Tryon, Jr.

Var. *gealei* (H. Adams). Pl. 15, fig. 3.

Shell minutely perforate, cylindrical, solid, obliquely striate, whitish; spire oblong, the apex conic, a little acute, yellow. Whorls 12-13, rather flattened, subangular above, the last a little ascending, shortly free in front. Aperture angulate-circular; peristome continuous, expanded and a little reflexed throughout. Length 15, diam. 5½ mm. (*H. Ad.*).

Putla, State of Oaxaca, Mexico (H. Ad.).

Cylindrella (*Holospira*) *gealei* H. Ad., P. Z. S., 1872, p. 13, pl. 3, f. 19.—Pfr., Monogr., viii, p. 447.

Published data afford no differences from *H. tryoni* of the neighboring State of Puebla, except that *gealei* is slightly larger, and has fewer whorls than the largest *tryoni.* The internal structure is unknown. Under the circumstances it seems best to follow von Martens' precedent and place *H. gealei* as a variety under *H. tryoni.*

10. H. veracruziana Dall.

"Shell closely resembling the enlarged figure of *H. microstoma* Pfeiffer, but with a short apical cone and larger aperture. According to the description of *H. microstoma,* the present species differs by having 17 whorls in a total length of 17.5 mm. against 18 whorls in a length of 15.5 mm. for *H. microstoma,* both having a maximum diameter of 5 mm. The last whorl in the present species is rounded below, that of *H. microstoma* angulated; in *H. veracruziana* the aperture is expanded, with the outer posterior part hardly angular where the outer lip meets the parietal portion; the diameter of the aperture is 3.5 mm. (against 2.6 in *H. micro-*

stoma), and the parietal portion is very little extended beyond the periphery of the preceding whorl; the whorls of the nucleus (1½) are smooth and polished, those of the apical cone finely ribbed, those of the rest of the spire striate, with a few coarse riblets just behind the peristome" (*Dall*).

E. Mexico: Mizantla, province of Vera Cruz (three specimens presented to the National Museum by the Mexican Geographical Commission).

Holospira (*Bostrichocentrum*) *veracruziana* DALL, Proc. U. S. Nat. Mus., xviii, p. 4 (1895); xix, p. 350 (1897).

This species has a strong, short fold at the base of the axis in the penultimate whorl, but no traces of any other laminæ. It is possible that the type of *H. microstoma* of Pfeiffer may have the aperture abnormal and be identical with this species, but in the uncertainty I have preferred to name the latter (*Dall*).

11. H. PILSBRYI Dall. Pl. 16, figs. 6, 7, 8, 9; pl. 23, fig. 76.

"Shell small, bluish or pinkish-white; the nucleus darker, 2-whorled, smooth, not much projected, followed by 6 obliquely striate, gradually increasing whorls which form a bee-hive-shaped dome to the spire, after which follow 6 nearly equal almost smooth whorls forming a nearly cylindrical spire; the last whorl slightly smaller, the base and neck near the aperture somewhat irregularly transversely wrinkled; suture distinct, here and there edged by wrinkles transverse to the whorl, but more or less obsolete, except near the suture; umbilical chink shallow, aperture a little oblique, subcircular, with a faint angulation near the upper outer corner; lip expanded, but hardly reflected; the peristome, viewed in its own plane, does not project beyond the lines representing the sides of the cylindrical part of the spire, but as the last whorl is smaller than those preceding it, the peristome projects slightly from it; throat of the aperture whitish without ridges; axis straight, slender, axial wall smooth. Length of large specimen 13, diameter 4 mm., with 14 whorls; length of short specimen 10.25, diameter 3.75 mm., with 12 whorls" (*Dall*).

Mexico: Puebla, State of Puebla, abundant around sulphur springs (Mex. Geogr. Comm.); types no. 56932, U. S. N. M. Arizona or New Mexico (Dr. E. Palmer).

Holospira (*Metastoma*) *pilsbryi* Dall., Proc. U. S. Nat. Mus., xviii, p. 4 (1895); xix, p. 349 (1897).—?*H. pilocerei* var. B, Crosse & Fischer, Miss. Scient. Mex., Moll., i, p. 329, pl. 17, f. 5.—Crosse, Journ. de Conch., xl, 1892, p. 266, pl. 5, f. 4, 4 *a*.

The whorls are less narrow and crowded than in *H. tryoni*. The internal pillar (pl. 23, fig. 76) is small, about 0.3 mm. diameter, and of about equal calibre throughout the cylindric portion of the shell. Within the latter part of penultimate and first part of the last whorl it has a distinct spiral swelling and twist in the middle; the pillar in the next earlier two whorls is either without perceptible twist, or visibly swollen near the base; but in still earlier whorls there is a narrow and distinct, though low, spiral ridge, as shown in the figure, which was drawn from one of the type lot, from near the City of Puebla, received from Prof. Dall. It is thus referable to the section *Bostrichocentrum*, though hardly typically developed for that group.

According to Dall, "a single specimen was found among loose shells brought home by Dr. Palmer after a trip through Arizona and New Mexico, but no particular locality could be assigned to it" (*Dall*). Numerous specimens in the collection of the Academy show but little variation.

Section *Haplostemma* Dall, 1895.

Dall, Nautilus, ix, p. 50 (Sept., 1895); Proc. U. S., Nat. Mus., xviii, p. 2; xix, p. 346.

"Axis moderate, with a short, stout, axial lamella extending about half a gyration in the penultimate whorl, but elsewhere simple and smooth. Type *H. mearnsii* Dall." (*haploos*, simple; *stemma*, wreath.)

This group is very close to *Bostrichocentrum*, probably not really separable.

12. H. mearnsii Dall. Pl. 16, figs. 12, 13.

Shell small, compact, with 14 whorls, of which 2 are nu-

clear, polished, and smooth; blunt above, gradually increasing to the ninth whorl and subsequently slightly attenuated; sculpture and aperture much as in *H. crossei,* the base slightly appressed and the ribs closer and more prominent than on the previous whorls; umbilicus not conspicuous; aperture projecting somewhat beyond the preceding whorl, the peristome hardly reflected, subtriangular, little thickened, without folds; axis small, subcylindric, with a strong, short lamella near the base in the penultimate whorl. Length of shell 14.5, maximum diameter 4.5 mm. (*Dall*).

New Mexico: *top of Hachita Grande Mountain,* Grant county (Dr. Mearns); found with *H. crossei,* but less common; no. 129991, U. S. N. M.

Holospira (*Haplostemma*) *mearnsii* Dall., Proc. U. S. Nat. Mus., xviii, p. 4 (1895); xix, p. 350, pl. 31, f. 1 (1897).

This species resembles *H. crossei* in general appearance, but is larger, with more projecting aperture, and frequently has an intercalary raised line dividing the interspaces of the ribs axially. The specimens are of a whitish color (*Dall*).

13. H. hamiltoni Dall. Pl. 23, figs. 72, 73.

Shell slender, polished, spindle-shaped, pinkish-white, with a darker livid apex, and about 13 whorls; nucleus blunt, smooth, later three whorls delicately obliquely striated, central whorls smooth, last whorl with delicate oblique riblets with wider interspaces; aperture projected, rounded, subangular at the right posterior corner, the lip entire, reflected, the pillar rather wide; the last whorl flattened and attenuated. Length 19, max. diam. 5 mm. (*Dall*).

Texas: Rio Grande Mts., Brewster Co., at a height of 3,500 feet, living on *Selaginella lepidophylla* Spring (James M. Hamilton); U. S. Nat. Mus., no. 107759.

Holospira (*Haplostemma*) *hamiltoni* Dall, Nautilus, xi, p. 38 (August, 1897); Proc. U. S. Nat. Mus., xxiv, p. 501, pl. 28, f. 2, 11 (1902).

"This species is very much like *H.* (*Metastoma*) *semistriata* [*semisculpta*] Stearns, externally, differing in its smaller and more slender shell and finer and more delicate sculpture of the later whorls near the aperture."

Subgenus HAPLOCION Pilsbry, 1902.

Internal axis smooth, the interior of the whorls without plaits or lamellæ; latter part of the last whorl straightened, not sinuous; the aperture not obstructed by folds or prominences of any kind. Type *H. pasonis* Dall. (*haploos,* simple; *kion,* pillar.)

This subgenus is closely related to *Bostrichocentrum* and *Haplostemma,* differing in the simplicity of the pillar within. *Metastoma* is distinct by peculiar modification of the last whorl. There are three groups of species.

I. Internal axis large, one-third the diam. of the shell; shell smooth, brown, composed of many (16½-19) closely coiled whorls. *H. fusca,* no. 20.

II. Internal axis smaller, one-sixth to one-fourth the diam. of shell; shell small (length 9-14 mm. in known species), brownish, compactly coiled, the whorls short, 11 to 13 in number, sculptured with ribs or riblets.

1. Internal axis swollen above, tapering below, about one-fourth the diam. of shell; *nepionic whorls strongly angular,* the rest coarsely ribbed; length 11-14 mm. *H. minima,* no. 19.
2. Internal axis smaller and of about uniform calibre; nepionic whorls not angular.
   a. Whorls of the cone flattened, and usually angular at the lower edge, finely and closely ribbed; length 9-11.3 mm. *H. remondi,* no. 18.
   b. Whorls of the cone convex, more strongly and distantly ribbed; length 11, diam. 3.7 mm. *H. crossei,* no. 17.

III. Internal axis very slender below, slightly wider above; shell rather large (length 22-29 mm. in known species), *white,* the individual whorls high, 11½-15 in number, the last one or two more coarsely ribbed than the intermediate whorls.

1. Whorls 14-15; length 22-23½, diam. 5½-6 mm. *H. semisculpta,* no. 15.
2. Whorls 12; length 29, diam. 7 mm. *H. coahuilensis,* no. 16.

3. Whorls 11½; length 22½, diam. 6½ mm.
H. pasonis, no. 14.

H. cretacea Pfr. (sp. no. 27), may belong near the last three species.

(*Group of H. pasonis.*)

14. H. PASONIS Dall. Pl. 16, figs. 14, 15; pl. 23, fig. 74.

Shell white, mostly smooth but hardly glossy, of eleven and a half whorls; two and a half smooth, inflated, nepionic whorls, the apex flattish, followed by several whorls which are minutely ribbed in harmony with the incremental lines, the ribbing gradually becoming obsolete over most of the shell, but reappearing on the last whorl, especially the basal part, sharper and somewhat crowded just behind the reflected lip; umbilicus closed or reduced to a minute chink; suture distinct, sutural edge continuing as a keel to the reflected margin of the aperture; aperture very short necked, almost circular, broadly reflected; the pillar, as usual in the genus, tubular above the last whorl, the axis externally simple but somewhat flexuous. Length 22.5, max. diam. 6.5 mm. (*Dall*).

Texas: Mule canon, El Paso county, at an elevation of 4,000 feet.

Holospira pasonis DALL, The Nautilus, viii, p. 112 (Feb., 1895); *Holospira* (*Metastoma*) *pasonis* DALL, Proc. U. S. Nat. Mus., xix, p. 348, pl. 31, f. 4, 5.

"This species is nearest to *H. coahuilensis* W. G. Binney, which has one or two more whorls, the last two proportionately more attenuated with more extended, sharper and more distant sculpture, and obtusely keeled or compressed base resulting in a much more triangular and narrower aperture. It is not particularly close to any of the other species hitherto described, the *H. semistriata* [error for *semisculpta*] Stearns being quite distinct. A marked character is the evenly rounded basal part of the whorl just behind the lip." (*Dall*).

The latter half of the last whorl has more numerous and closer riblets in the specimens before me (part of the type lot) than shown in fig. 15, a copy of Dall's figure of the type. The internal pillar is small, about 1 mm. in diam. above,

tapering to about 0.7 mm. within the penultimate whorl. The cylindrical portion of the shell passes very gradually into the slowly tapering cone (pl. 23, fig. 74).

15. H. SEMISCULPTA Stearns. Pl. 16, figs. 3, 4.

Shell dextral, elongately cylindrical, pupiform, largest in the middle, tapering above and below, with fourteen to fifteen whorls; whorls somewhat convex; sutures distinct, though but slightly impressed. The upper two or two and a half whorls which form the apex are smooth, slightly tortuous, papillose. The succeeding four to five whorls are finely obliquely plicated; the middle whorls, four to five in number, are nearly or quite smooth, the sculpture when apparent being inconspicuous. The lower three or three and a half whorls are marked by sharp, thin, and rather obliquely curved lirae, which increase in number or closeness as the mouth is approached. The termination of the basal whorl projects considerably, is sharply angulated above on the projecting portion, which is also obtusely angulated on the under side. Aperture continuous, moderately effuse, roundly ovate, and flatly rimmed. Umbilicus a simple chink. Shell of a delicate pinkish-white, with a tint of faint purple on some of the upper whorls. Length 22-23½, diam. 5½-6 mm. (Stearns.)

State of Chihuahua, Mexico, in a canon above San Carlos, on limestone cliffs (T. W. Stanton); three specimens, no. 102310, U. S. Nat. Mus.

Holospira semisculpta STEARNS, Proc. U. S. Nat. Mus., xiii, 1890, p. 208, pl. 15, f. 1, 4.

Closely allied to *H. coahuilensis* W. G. B. and *H. pasonis* Dall, but smaller than either, with more whorls. Dall ascertained the internal pillar to be simple and smooth.

16. H. COAHUILENSIS (W. G. Binney). Pl. 23, figs. 66-69.

Shell rimate, cylindrically ventricose, thin, smooth or delicately striate on the upper whorls, strongly ribbed on the last two; white; composed of 12 ventricose or flattened whorls; apex obtuse, shining; upper 3 whorls of about equal diameter and smooth, the next 4 rapidly increasing in width and stri-

ate, the next whorl the widest of all and smooth, the remainder very rapidly decreasing in diameter towards the attenuated base; last whorl with about 10 elevated ribs, not carinated below, and appressed against the shell so as hardly to be rimate, until extended beyond it, and ending in a continuous peritreme expanded around the subquadrate aperture. Length 29, greatest diam. 7 mm. (*Binn.*)

Cienga Grande, State of Coahuila, Mexico (coll. Smithsonian Inst.).

Cylindrella coahuilensis W. G. B., Amer. Journ. of Conch., i, p. 50, pl. 7, f. 4, 5 (Feb. 15, 1865).—Pfr., Monogr., viii, p. 445.—*Gongylostoma coahuilensis* Binn., Tryon, Amer. Journ. of Conch., iii, p. 312, pl. 15, f. 29.—*Holospira c.*, Fisch. & Crosse, Miss. Scient. Mex., Moll., i, p. 334.—Crosse, Journ. de Conchyl., xl, 1892, p. 274, pl. 5, f. 1, 1 *a*.—*Metastoma c.*, Dall., Proc. U. S. Nat. Mus., xix, p. 351.

Crosse has figured a specimen somewhat broken measuring, length 25, diam. 6 mm. (figs. 68, 69). Figures 66, 67 are copied from Binney's original illustration.

(*Group of H. remondii*).

17. H. crossei Dall. Pl. 23, figs. 64, 65, 75.

Shell small, compact, 12-whorled, of a brownish-gray color; nuclear whorls 2, smooth, polished, apically blunt, succeeding 4 gradually and evenly increasing, after which the shell is cylindrical; sculpture of pretty even, slightly oblique, rounded riblets, extending from suture to suture and separated by interspaces twice as wide as the ribs; suture distinct; base rounded, with a shallow umbilical chink; aperture simple, slightly oblique, not projecting beyond the periphery of the preceding whorl, the lip slightly expanded in front of a faint constriction, the opening subcircular without internal ridges, the outer anterior part obtusely angular; axis small, regularly increasing to the last whorl, not inflated. Length of shell 11, maximum diameter 4 mm. (*Dall.*)

New Mexico: *Top of Hachita Grande Mountain,* Grant county (Dr. Mearns); no. 129989, U. S. N. M.

Holospira (*Metastoma*) *crossei* Dall, Proc. U. S. Nat. Mus., xviii, p. 3 (1895); xix, p. 348, pl. 31, f. 2 (1897).

This species resembles *H. goldfussi* Menke, but is slightly smaller, with a shorter neck to the aperture and a less reflected and triangular peristome. It is entirely destitute of the remarkable internal lamellæ which characterize *H. goldfussi.* It is named in honor of M. H. Crosse, who has monographed the genus. (*Dall.*)

In the single specimen I have seen (pl. 23, fig. 75) the riblets are subobsolete on the cylindrical portion of the shell. The column is of about equal diameter throughout the cylindrical portion. *H. crossei* is most nearly related to *H. remondii,* but differs in the coarser external sculpture, somewhat more slender contour, and the convex, not flattened, whorls of the terminal cone.

18. H. REMONDII (Gabb). Pl. 23, figs. 61-63, 70; pl. 24, figs 1-4.

Shell perforate and rimate, cylindric, conic above, thin, pale brown. Whorls 11½-12½, the first 2 smooth, convex, the first whorl wider and more bulging than the second; following 4 whorls (pl. 24, fig. 4) gradually widening, the cone flattened, angular, and projecting more or less above the suture, sharply and finely ribbed obliquely, the riblets much narrower than the intervals. Succeeding whorls are convex and obliquely ribbed, but in many specimens the riblets become subobsolete on the last 2 or 3 whorls. The last whorl is a little narrower, scarcely projects beyond the level of the ventral outline, and is rounded below, but with the base defined by an obtuse angle, and usually perforated by a distinct though small, rounded umbilicus. Aperture circular externally, somewhat ovate inside, the peristome expanded throughout. Internal column (pl. 23, fig. 70) small, smooth, a trifle larger above, and with a weak spiral swelling in the penultimate whorl.

Length 11.3, diam. 3.7 mm.; whorls 12½.

Length 9, diam 3.2 mm.; whorls 11½.

State of Sonora, Mexico: 1½ leagues from Arivechi, Sahuaripa Valley (A. Rémond).

Cylindrella remondii GABB, Amer. Journ. of Conch., i, p.

208, pl. 19, f. 10-13 (July, 1865).—Pfr., Monogr., vi, p. 389; viii, p. 446.—*Holospira remondii* Gabb, Tryon, A. J. C., iii, p. 313, pl. 15, f. 32.—Fischer & Crosse, Miss. Scient. Mex., Moll., i, p. 325, pl. 17, f. 2; Journ. de Conchyl., xviii, 1870, p. 24.—Crosse, Journ. de Conchyl., xl, 1892, p. 262, pl. 5, f. 8, 8 *a*.

This species varies a good deal in size, and in the degree to which the striation extends upon the lower whorls, but otherwise is rather constant. The whorls of the cone project above the sutures more or less in all the 8 specimens of the type lot, but only slightly in some. The riblets are narrow and simple, and the enlarged first whorl is rounded and bulging, not angular as in *H. minima*. It differs from *H. crossei* in the flattening of the post-nepionic whorls of the cone and the perforate base. *H. arizonensis* is slightly larger, with smoother median whorls and less perfectly circular peristome, and it differs in internal structure.

19. H. minima (v. Martens). Pl. 23, fig. 59; pl. 24, figs. 5-9.

Shell rimate and perforate, cylindric, tapering in a rather long cone above, thin, pale fleshy-brownish with lighter ribs, the apex often darker. Whorls 11 to 12½, the first 2 smooth, *strongly angular* at the shoulder above, the upper and lateral surfaces flattened (pl. 24, fig. 8); following whorls of the cone *strongly convex, angular in the middle*, sculptured with stout rounded ribs, which when worn are seen to be hollow. Succeeding whorls are convex, sculptured with strong, regular ribs as wide as their intervals, and also hollow, in places broken and showing the two lateral laminæ only. On the last two or three whorls the ribs are somewhat smaller, and on the last one they split or suddenly diminish on the base, except upon the rounded part of the whorl behind the aperture. Aperture subcircular, its plane not produced beyond the general outline of the ventral side of the shell; peristome white, expanded and reflected, continuous and free. Internal column smooth, widest above, gradually tapering downwards, a little exceeding 1 mm. in greatest calibre.

Length 13-14, diam. 4.2 mm.; whorls 12½.

Length 13.5, diam. 4 mm.

Length 11.7, diam. 4 mm.; whorls 11⅓.

State of Sonora, N.-W. Mexico: Cerro de la Campana, near Hermosillo (A. Rémond).

C[ylindrella] pfeifferi Gabb, Amer. Journ. of Conch., i, p. 208.—*Holospira pfeifferi* Crosse & Fischer, Journ. de Conchyl., xviii, 1870, p. 13, pl. 5, f. 6-10 (jaw and teeth); *H. p.* var *b*, C. & F., Miss. Scient. Mex., Moll., i, p. 324, pl. 17, f. 1.—Crosse, J. de Conch., xl, 1892, p. 261, pl. 5, f. 7, 7 *a*.—*H. p.* var. *minor* v. Martens, Biologia Centrali Americana, Moll., p. 280, and var. *minima*, p. 280, pl. 16, f. 18.—*H. minima* v. Mart., Pilsbry, Nautilus, xiv, p. 118.

This species is readily recognized by the angular upper whorls and the very coarse though closely standing ribs, which when broken down are seen to be hollow. I am quite unable to see anything further than the usual individual variation between the varieties *minor* and *minima*, recognized by von Martens. In the specimens before me there are 32 to 34 ribs on the penultimate whorl. The original descriptions of *minima* follow, and the original figure is copied on pl. 23, fig. 60.

"Subconic-turreted, densely, delicately lamellose-costate, flesh-colored, the ribs white; aperture rounded; base perforated; whorls 11, convex; length 11½, greatest diam. 4, diam. of penult. whorl 3½; length of aperture 2½, width 2½ mm.

"Length 11½ mm. only, 4 in the largest diameter; aperture 2½ mm.; whorls 11, distinctly convex; color reddish-yellow, the costæ white. Mexico, without nearer indication of locality (coll. Pätel)."

Var. *pereostata* Pils. Pl. 24, fig. 7. Whorls 11-11½; ribs more widely spaced, 23 to 26 on the penultimate whorl; length 11.6 to 12.4, diam. 4 mm. N.-W. Mexico.

(*Group of H. fusca*).

20. H. fusca v. Martens. Pl. 25, figs. 8-14.

Shell rather widely umbilicated, fusiform-cylindrical, close-whorled, thin, very lightly obliquely striatulate, lilac-brown. Whorls 19, the first 2 subglobose, smooth, pale corneous (rarely blackish), following 7 whorls somewhat rapidly

increasing, forming a high cone, the later whorls slightly decreasing, a little convex, the suture moderately impressed; last whorl with swollen rounded base, somewhat ascending in front, very shortly produced forward. Aperture vertical, subcircular; peristome a little thickened throughout, narrowly expanded, white, the upper margin transverse, outer angle distinct, the margins elsewhere arcuate. (*v. Mart.*)

Length 16, diam. penult. whorl 4, greatest diam. 5, length aperture 3½ mm.

Length 14½, diam. penult. whorl 3, greatest diam. 3⅓, length aperture 2½ mm.

Length 12, diam. penult. whorl 3, greatest diam. 3½, length aperture 2½.

S.-W. Mexico: Omilteme, State of Guerrero (H. H. Smith).

Holospira fusca v. Mart., Biologia Centrali Americana, Moll., p. 281, pl. 16, f. 19-24 (December, 1897).—*Holospira umbilicata* v. Mart., Sowerby & Fulton on label.

Chiefly remarkable for the brown color and comparatively large internal column, which is at least usually open below. This column is pale brown with the usual whitish lines in its substance, and within several of the later whorls it is perceptibly swollen just below the middle, as in *Cœlocentrum*. In a shell with 16½ whorls, measuring, length 12, diam. 3.4 mm., the column is 1.3 mm. wide, being over one-third the diameter of the shell. The first and second whorls are wider than the third.

Only large specimens have as many as 19 whorls, those of 12 to 13 mm. length having only 16½ to 17. The shells before me (figs. 8, 9, 10, part of the original lot) are brown, and in a slight degree translucent, the internal axis showing faintly through in one specimen. Figs. 11-14 are from von Martens' original illustrations.

Subgenus Metastoma Strebel, 1880.

Strebel, Beitrag, etc., iv, p. 80, for *M. roemeri* Pfr.

Internal column smooth and cylindrical, of moderate size; without internal lamellæ. Last whorl sinuous, its latter portion turning sinistral. Aperture longitudinally oval, ob-

structed by a strong fold within the right margin, and a callous ridge upon the columella. Type *H. roemeri* Pfr. (*meta,* after or among, but here used in the sense of "changed;" *stoma,* mouth).

21. H. ROEMERI (Pfeiffer). Pl. 25, figs. 1-7.

Shell rimate or perforate, cylindric, often a little wider above than below, terminating in a rather short cone above; rather thin, pale brown. Surface somewhat glossy, smooth except for light growth-lines, but finely and rather sharply striated on the terminal cone. Whorls 12½ to 14, but slightly convex, the last tapering, strongly carinate beneath, its latter portion sinuous, becoming sinistral, shortly free in front; base excavated, concave. Aperture oblique, oblong, the longest axis parallel to that of the shell, contracted by a callous barrier deep in the throat on the columellar side, and a prominent, angular fold within the right lip. Peristome continuous, free, slightly reflected. Internal column smooth, moderately large, its diameter about one-fourth that of the shell, of nearly equal calibre throughout.

Length 15.7, diam. 4.5 mm.; whorls 13¾. Near El Paso.

Length 14, diam. 4.4 mm.; whorls 13½. Near El Paso.

Length 13-14, diam. 4.5 mm.; whorls 14. New Braunfels (Pfr.)

Length 12, diam. 3.8 mm.; whorls 12½. New Braunfels.

Length 12, diam. 4.2 mm.; whorls 11. Sacramento Mts.

Length 13, diam. 4 mm.; whorls 12. Sacramento Mts.

Length 14.8, diam. 4 mm.; whorls 12¾. Sacramento Mts.

Texas: New Braunfels, Comal Co. (Roemer, Singley *et al.*); Howard's Spring, Crockett Co. (Binney); Devil's River region and Painted Cave, near the mouth of the Pecos River, Val Verde Co. (W. Lloyd); Franklin Mt., near El Paso (J. H. Ferriss). Also southern New Mexico, in Alamo Canon, near Alamogorda, Otero Co., in the foot-hills of the Sacramento Mts. (Rehn and Viereck).

Cylindrella roemeri PFR., Mon. Hel. Viv., ii, p. 382 (1848); iii, 579; iv, 710; vi, 389; Conchyl. Cab., p. 62, pl. 7, f. 4-6 (bad); Roemer's Texas, p. 456 (1849).—BINNEY, L. and

Fresh-water Shells of N. A., i, p. 24, f. 18; Terr. Moll., iv, p. 150.—*Holospira roemeri* Pfr., Tryon, Amer. Journ. of Conch., iii, p. 312.—Binney, Terr. Moll., v, p. 177, f. 85; Man. Amer. Land Shells, p. 422, f. 467.—R. E. C. Stearns, Proc. U. S. Nat. Mus., xiv, 1891, p. 100.—*Metastoma roemeri* Pfr., Strebel, Beitrag, iv, p. 80 (1880).

In this peculiar species the last whorl turns directly forward at its termination, becoming in effect sinistral; there is a strong fold within the right lip, and an excavation in its place on the exterior of the whorl. The columella is noticeably calloused. It was originally found at New Braunfels, a place evidently at the eastern limit of its range, as the hill country gives place there to a lower and more level region of mesquite chaparral, supporting a different and poorer fauna. Thence it extends to the western extreme of the State near El Paso (figs. 2-5), and northward to the lower lying canons of the Sacramento Mts. in New Mexico (figs. 1, 6, 7). The largest specimens I have seen are from near El Paso. Stearns states that those from Val Verde Co. have 13 to 16 whorls. Shells from the Sacramento Mts. are mainly shorter and broad, though long specimens also occur. Many of the short shells are umbilicate, but others are imperforate. New Braunfels specimens also vary in size. The lower edges of the whorls of the cone sometimes project angularly, as in some individuals of many other species. This is probably due to progressively more unfavorable conditions of nutrition during the period of rapid growth.

Subgenus Coelostemma Dall, 1895.

Dall, Nautilus, ix, p. 50 (September, 1895); Proc. U. S. Nat. Mus., xix, p. 347.

Shell many-whorled (17-21 whorls in known species), with short terminal cone, the internal column vertically ribbed (as in *Cœlocentrum*), and of moderate or large diameter. Type *H. elizabethæ* Pils. (*koilos*, hollow; *stemma*, wreath).

The known species are Mexican. The group is remarkable for its homoplastic relation to *Cœlocentrum*, some species having the internal pillar granulose from interruption or

entire breaking up of the vertical riblets, as in some forms of the genus mentioned. Only three species are known.

H. elizabethæ: Shell cylindric or club-shaped, white or whitish, widest above, the internal column of the same shape, and nearly half the diameter of the shell.

H. dalli: Shell barrel-shaped, dotted or flecked, widest below the middle, the internal column similarly shaped, half the diameter of the shell.

H. strebeliana: Shell cylindric, very blunt at the ends, dotted, the internal column cylindric and one-third the diameter of the shell.

H. microstoma (species no. 25) and *H. imbricata* (sp. no. 26) may belong to this subgenus, but their internal characters are undescribed.

22. H. ELIZABETHAE Pilsbry. Pl. 15, figs. 6-15; pl. 26, fig. 27.

Shell rimate (rarely perforate), cylindrical or club-shaped; usually being wider and sometimes swollen above, terminating in a short cone; white or fleshy-white, the apical whorls generally blackish; moderately solid. Whorls varying from 17 in short to 21 in long individuals, closely coiled and but slightly convex, the sutures slightly impressed, but sometimes emphasized by the slight angular projection of some whorls over those following. Earliest 2 whorls smooth (the first larger), following 5 or 6 whorls of the cone closely and finely striate; subsequent whorls nearly smooth except the last, which has distinct riblets much narrower than their intervals. Last whorl rounded below, flattened above, somewhat produced forward. Aperture rounded, the upper margin straightened, peristome expanded, thin. Interior pale ochre tinted. Internal column large, wider above; white, slightly contracted and smooth at the base within each whorl, elsewhere irregularly ribbed, the ribs narrow, oblique and acute, wanting within the whorls of the terminal cone.

Length 21.6, greatest diam. (above) 6, diam. of penult. whorl 5 mm.; whorls 21.

Length 17, greatest diam. (above) 6, diam. of penult. whorl 5 mm.; whorls 17½.

Length 19, greatest diam. (above) 5.6, diam. of penult. whorl 5 mm.; whorls 19½.

Length 18.6, greatest diam. (above) 5.3, diam. of penult. whorl 5 mm.; whorls 20½.

Length 15.4, greatest diam. (above) 5.7, diam. of penult. whorl 4.8 mm.; whorls 17½.

Length 15, greatest diam. (above) 5.3, diam. of penult. whorl 5.3 mm.; whorls 17.

State of Guerrero, Mexico: Amula, between Chalapa and Tixtla (H. H. Smith).

Holospira elizabethæ Pils., Proc. Acad. Nat. Sci. Phila., 1889, p. 81, pl. 3, f. 1-5.—Crosse, Journ. de Conchyl., 1892, p. 272, pl. 5, f. 6, 6 *a*.—v. Martens, Biologia, Moll., p. 635.—*Holospira claviformis* v. Martens, Biologia Moll., p. 277, pl. 16, f. 10-16 (December, 1897).

This species varies from a nearly cylindrical to a club-like shape, and from short to lengthened. Occasionally the upper part is swollen and bulbous, as in fig. 7 (above fig. 8). The shape of the internal column varies with that of the shell, but it seems always to be at least a little wider above. Thus in two specimens the measurements of shell and axis are as follows:

Length 17½, diam. above, shell 6.3, axis 3.1; diam. in penult. whorl, shell 5.5, axis 1.8 mm.

Length 18, diam. above, shell 5.2, axis 2.5; diam. in penult. whorl, shell 5, axis 1.8 mm.

The terminal cone is short and well defined from the cylindrical portion. One of the original specimens has built out a second peristome on the face of the last whorl, at a right angle to the normal one, in consequence of a hole accidentally broken there.

H. elizabethæ and *H. claviformis* were described from specimens out of the same lot. Mr. Smith showed me a half pint or more of them, on his return from Mexico in 1888.

23. H. dalli Pilsbry, n. sp. Pl. 26, figs. 28, 29, 30, 31.

Shell narrowly umbilicate, barrel-shaped, widest below the middle, slowly tapering both downwards and upwards, then

rapidly contracting above in a short terminal cone; white with a pink or flesh tint, rather profusely dotted and sparsely streaked, and with the apical whorls also fleshy. Whorls 19½, the first 2 smooth, corneous-brown, the initial whorl being wider and projecting nipple-like; succeeding whorls up to about the 9th rapidly widening the cone, but extremely short and slowly increasing in width; then the shape becomes subcylindric, the girth slowly widening as far as the 3d and 4th whorls from the last, which are widest. The last whorl is distinctly narrower and tapering, its latter half rounded below, flattened above, and angular at the junction of outer and upper surfaces; produced forward. Sculpture of very fine, close striæ on a few whorls succeeding the smooth apical two, the rest of the shell nearly smooth except the latter half of the last whorl, which is sharply, irregularly striate. Aperture rounded, with an angle at the junction of upper and outer margins; peristome expanded, somewhat thickened. Interior slightly ochre-tinted. Column very wide, of the shape of the shell, widest within the 3d and 4th whorls from the last; sculptured with narrow, spaced riblets, often crenulate or interrupted, and closely-strewn granules; the sculpture obsolete on the upper third of the column and within the last whorl.

Length 15, greatest diam. of shell 6, of internal column 3 mm.

Sierra Guadalupe, Mexico, at 6,500 ft. elevation (Dr E. W. Nelson).

An extraordinary species, with the internal column wider than in any other known form of the genus, and copiously granulose as well as ribbed—a modification parallel to what occurs in some forms of *Cœlocentrum.* While not always as wide as the figured specimen, it apparently never becomes cylindrical and slender like the following species.

24. H. STREBELIANA Pilsbry, n. sp. Pl. 26, figs. 24, 25, 26, 28.

Shell perforate and rimate, long and *cylindrical, terminating above in an extremely short cone* with mammillate apex; blue-white or lilac-white, copiously dotted and with a few

oblique streaks of fleshy-brown, several earlier whorls of the same color. Whorls 19½ to 21¼, hardly convex, the first two smooth, following whorls of the cone densely and finely striate, the cylindrical portion smooth except for indistinct, subobsolete, coarser wrinkles; last whorl either smooth or regularly ribbed, its latter half with crowded and rather sharp striation; it tapers downwards, and is well rounded beneath, flat above, and considerably built forward. The aperture is rounded-piriform, angular at the upper outer part; peristome white, expanded and subreflexed, straightened above. Interior ochre-brown; the column is also tinted, small for a *Cœlostemma*, and of about equal width throughout the cylindrical portion, one-third the diameter of the shell. Its surface is glossy and sculptured with slightly oblique, subvertical riblets, with a few granules in places, formed by their dislocation.

Length 16, diam. 5.5 mm.; whorls 19½.

Length 17.2, diam. 5.4 mm.; whorls 21¼.

Sierra Guadalupe, Mexico, at 6,500 ft. elevation (Dr. E. W. Nelson).

This species is chiefly remarkable for its long, cylindrical, many-whorled shell, very blunt at the ends. While related to *H. dalli* by its coloration and short apical cone, it differs conspicuously in the slender internal column, as well as by its pillar-like shape. The specimens occurred with *H. dalli* and *H. nelsoni*.

SPECIES OF UNKNOWN SYSTEMATIC POSITION.

25. H. MICROSTOMA (Pfeiffer). Pl. 15, figs. 4, 5.

Shell subperforate, cylindrical, smooth, chalky; spire dilated above, passing into a short and rather acute cone; suture impressed. Whorls 18, rather flat, equal, the upper ones plicatulate, the last striated, free in front, carinated above, angular at the base, the angle disappearing anteriorly near the mouth. Aperture small, vertical, subtriangular; peristome narrowly expanded throughout. Length 15½, diam. 5 mm.; oblique length of aperture 2⅔ mm. (*Pfr.*)

Habitat unknown (Cuming coll.).

Cylindrella microstoma Pfr., P. Z. S., 1861, p. 27; Malak. Blätter viii, 1861, p. 81; Monogr., vi, p. 390.—*Holospira microstoma* Pfr., Fisch. & Crosse, Miss. Scient. Mex., Moll., i, p. 337, pl. 17, f. 9.—v. Mart., Biologia, p. 278.

The interior is unknown, but it probably belongs to *Cœlostemma*, differing from *H. elizabethæ* and *strebeliana* in the angular base, and from the latter in color and the longer terminal cone. The figures are from Fischer & Crosse.

26. H. imbricata (v. Martens). Pl. 15, figs. 1, 2.

Shell imperforate, obovate, swollen above, then passing into a short cone, rather solid, ribbed, gray-whitish; the apex entire, projecting. Whorls 16, flat, the first 2 smooth, following 7 rather rapidly increasing, sculptured with strong oblique ribs, the succeeding 4 whorls more slowly decreasing in calibre, some being over-lapped by the projection of the preceding; penultimate and last whorls arcuately costate, the anterior part of the last free, built forward, curved in, the base hardly angular. Aperture vertical, obliquely piriform, peristome wanting in the type specimen. Length 16, diam. at 10th whorl 8, at penult. whorl 5½ mm.; alt. of aperture 4, width 3 mm. (*v. Mart.*)

Mexico (Uhde).

Cylindrella (*Holospira*) *imbricata* Mart., Monatsber. Berl. Akad. Wissensch., Nov., 1863, p. 540; Malak. Blätter, xii, 1865, p. 15, pl. 1, f. 2, 3.—Pfr., Monogr., vi, p. 390.—*Holospira imbricata* Martens, Fisch. & Crosse, Miss. Scient. Mex., Moll., i, p. 336.—v. Mart., Biologia, Moll., p. 273, pl. 16, f. 25.

"This very distinct species does not appear to have been found by any subsequent collector. It differs from all others of the genus in the short, club-like form of the shell, the greatest diameter being in the tenth whorl (at about one-third of the whole length, as seen from above), the following whorls diminishing remarkably in diameter, and the under edge of some of them projecting a little over the following whorl. Fischer and Crosse's figure of *H. gealei* resembles it somewhat in outline, but is not so strikingly swollen above, and wants the vertical costæ." (*v. Mart.*)

27. H. CRETACEA (Pfeiffer). Pl. 15, figs. 16, 17.

Shell rimate, oblong-turreted, cretaceous; spire more swollen in the middle, the apex subtruncate or terminating in a short cone; suture shallow. Whorls 13-14, a trifle convex, smooth, the penultimate semiplicate, the last strongly ribbed, base compressed-carinate, anteriorly horizontally and shortly built forward. Aperture vertical, subtriangular; peristome continuous, rectangularly spreading throughout. Length 24, diam. 7, oblique length of aperture 5½, width 4⅔ mm. (*Pfr.*)

Mexico (Cuming coll.).

Cylindrella cretacea PFR., P. Z. S., 1860, p. 140; Malak. Blätter, 1861, p. 81; Monogr., vi, p. 389.—*Holospira cretacea* Pfr., F. & C., Miss. Scient. Mex., Moll., i, p. 335, pl. 17, f. 8.—v. MART., Biologia, p. 279.

The interior is unknown. External features indicate, as von Martens remarks, a relationship with *H. coahuilensis*.

28. H. TERES (Menke). Pl. 15, figs. 18, 19, 20.

Shell cylindrical, with conic entire and acute apex, rimate, somewhat solid, opaque, white (*candida*), shining. Whorls 14, a little convex, the upper smooth, lower densely and obliquely, delicately costellate, scarcely protracted. Aperture orbiculate; peristome continuous, free, reflexed. Length 9.7, diam. 2.2 lines. (*Menke.*)

State of Puebla, Mexico (Liebmann).

Cylindrella teres Mke., Zeitschr. f. Malak., iv, p. 1 (1847).—PHILIPPI, Abbild., iii, p. 5, pl. 3, f. 5, 6.—PFR., Monogr., ii, p. 381; Conchyl. Cab., p. 59, pl. 6, f. 28, 29.—*Holospira teres* Mke., FISCH. & CROSSE, Moll. Mex., p. 327.—CROSSE, Journ. de Conch., 1892, p. 263.—v. MART., Biologia, p. 279.—*H. t.* var. *minor* MARTENS, l. c., based upon var. B, Fischer & Crosse, l. c., pl. 17, f. 3; *cf.* CROSSE, J. de C., 1892, p. 264, pl. 5, f. 9.—*H. t.* var. *hogeana* v. MART., l. c., p. 280, pl. 16, f. 17.

A white, earthy species of rather large size, Pfeiffer giving the dimensions, length 22, diam. 5½ mm.; aperture 4 mm. long, 4½ wide. Nothing is known of its internal structure.

Form *minor* v. Martens. (Pl. 15, figs. 21, 22.) Smaller

than the typieal form, with only 12 whorls, the 7th, 8th and 9th swollen. Length 12, diam. 4 mm. Occurs in the State of Puebla, coll. by Liebmann. It is probably only a small individual, such as oeeur in many speeies.

Var. *hogeana* v. Martens. Pl. 23, fig. 71.

"Aperture with a distinet angle outwardly and above, as in *H. goniostoma;* size, sculpture and eolor as in *H. teres.* Whorls 15. Length 17, greatest diam. 4⅓, of penult. whorl 3½ mm.; length of aperture 3½ mm. (*v. Martens.*)

Maltrate, on the railway between Vera Cruz and the eity of Mexieo, a little west of Orizaba, eastern slope of the plateau. (*Hoge*).

This variety is probably identical with the prior *H. veracruziana* Dall, p. 85.

Subfamily Urocoptinae Pilsbry.

The Antillean genera of *Urocoptidæ* form a subfamily distinet from the mainland forms by (1) the speeialization of the teeth, the eentral row being narrow, without eetocones, the side teeth having ectocones widely separated from the mesoeones, and none of them developing the entoeone; (2) the jaw is very thin and delicate, high-arched, eomposed of many narrow plaits eonverging mesially, as in *Drymæus.* To what extent the soft anatomy differs can only be determined by further investigation; but in the single Antillean speeies I have thoroughly examined there are several features widely diverging from the Mexiean genera.

An inconsiderable number of species of this subfamily have gained a foothold on the mainland. See under *Cochlodinella, Brachypodella* and *Macroceramus.*

In dealing with Jamaiean forms I have been materially assisted by Messrs. P. W. Jarvis and John B. Henderson, Jr. Mr. Jarvis supplied a large series of speeimens, many of which are illustrated on the following plates, and furnished data upon the distribution of the speeies which eould have been obtained from no other source, together with notes upon the species, valuable on aeeount of his large experience with

Jamaican snails. Mr. Henderson with the greatest generosity placed his whole collection, the results of two journeys to Jamaica, at my disposal. Having at my hand the results of the studies of two specialists upon the Jamaican fauna, the following account has been made much more complete than would otherwise have been possible.

Genus UROCOPTIS Beck, 1837.

Urocoptis Beck, Index Molluscorum, p. 83, for *petiveriana* Fér.; *blainvilleana* Fér.; *cylindrus* Ch., Dw. and Wood; *rosata* Fér.; *glandula* B., *abbreviata* B., *coarctata* B., Lister H., xxi, 17; *truncatula* Lam. (*clausilia*); *gracilicollis* Fér.—J. E. Gray, Proc. Zool. Soc. Lond., 1847, p. 177, *Turbo cylindrus* selected as type.—Pilsbry & Vanatta, Proc. Acad. Nat. Sci. Phila., 1898, pp. 267, 270, 274.—*Cochlodina* Fer., Tableau System. etc., pp. 24, 61 (1822?) in part.—*Cylindrella* Pfr., Archiv f. Naturgeschichte, 1840, p. 41, in part.

Shell lengthened, either cylindric, fusiform or oval, usually losing the early whorls in adult life; whorls usually numerous, narrow and slowly widening, compactly coiled around an imperforate columellar axis. Jaw delicate, arched, composed of numerous plaits. Radula with teeth in V-shaped rows, the centrals small, side teeth all of the same general form, gradually decreasing from the inner to the outer, having large, gouge-shaped mesocones and large posterior cusps (ectocones). Type *U. cylindrus*.

Distribution, Jamaica, Haiti and Cuba, with a single species in southern Florida.

This genus has usually been known as *Cylindrella*, owing to the use of that name by Dr. L. Pfeiffer who for thirty years or more, in the middle of the last century, was justly held to be the chief authority in the world on land snails. The name *Urocoptis* ("cut tail," in allusion to the truncation of the spire) was proposed several years earlier than *Cylindrella*, for the same group, by H. Beck, also a naturalist of marked genius in taxonomic studies. The list of species cited by Beck as components of his new group included no less than six undescribed forms, the first recognized species of the num-

ber being *cylindrus*, which was selected as type of the group by Gray in 1847. Probably all of the species cited by Beck belong to the group of large typical forms, except the last, *gracilicollis*, which is a *Brachypodella*. Only two of Pfeiffer's original list of *Cylindrella* belong to the genus *Urocoptis* as now understood, five preceding them falling in *Brachypodella*, and one following is a *Clausilia*. The subgenus *Cochlodina* of Férussac contained several species of *Urocoptis*, together with many species of *Clausilia* and other genera; but his diagnosis agrees only with *Clausilia*. The standing of *Urocoptis* as the generic name for the present group seems therefore secure.

Two species, *U. scæva* and *U. coronadoi*, are sinistral. All the rest are dextral.

Soft Anatomy of Urocoptis.

The foot (in *U. brevis* from Milk River, Clarendon, Jamaica, and *U. poeyana*, Miami, Florida) is very short; upper surface irregularly granose, without pedal grooves or a distinct margin; sole not divided longitudinally, finely wrinkled transversely in alcoholic preparations of *U. poeyana*, irregularly and coarsely so in *U. brevis*. The mantle has small right and left neck-processes near the pneumostome.

The genitalia (pl. 27, fig. 44, *U. brevis* x 5). Atrium very short. Penis (*p.*) very stout, without special retractor muscle, the apex being attached to the right ocular muscle. There is an ample vagina, the spermatheca (*sp.*) being small and ovate, on a very long duct (*d. sp.*). The uterus is long, ample, and sacculate as usual. The ovo-testis is imbedded in the lower lobe of the liver, and is lodged near the base of the conic portion of the shell.

The free retractor muscles (pl. 27, fig. 44, *U. brevis* x 5). The right ocular retractor (*r. o.*) is united for some distance with the columellar muscle (tail and mantle retractor, *c.*). The left ocular band (*l. o.*) and the pharyngeal retractor are free to their common insertion with the columellar muscle, on the axis of the shell in about the fourth whorl. The apex of the penis is attached to the right ocular band, which thus functions also as a penial retractor muscle.

The pharynx is short, shaped as in the Helicidæ. The long, slender salivary glands are united posteriorly. The right gland excretes through the left duct, the left through the right duct. The œsophagus is very slender (pl. 27, fig. 44). The fore-gut is closely applied to the central axis, curves laterally to pass into the stomach (pl. 27, fig. 45, *st.*), which is white and somewhat over a whorl long. A short loop is formed shortly beyond it (fig. 45, *g2, g3*), making the digestive tract four-folded, as is the rule in Stylommatophora. The hind-gut (fig. 45, *g4*) follows the suture, being peripheral in position. The liver (fig. 45, *l*) occupies the first two whorls exclusively, and its lower lobe (removed in fig. 45) extends at least two whorls further down, sharing the space with the stomach and ovo-testis.

The jaw (pl. 50, fig. 8, *U. dautzenbergiana*) is highly arched, thin, composed of many narrow, subvertical, slightly imbricating plaits, which converge downward, leaving several short plaits in the middle. The number of plaits varies from 32 in *U. elliotti* to 56 in *U. sanguinea.*

The radula is long and rather narrow, varying more in width than in length. Teeth are arranged in V-shaped transverse rows, the apex of the V directed inward. The general form of the individual teeth is shown in fig. 6 of plate 60, representing the third left lateral tooth of *Urocoptis ventricosa* seen from above, and fig. 5, the fourth lateral, in profile. The basal plates (*b*) are quadrangular in general contour. At the middle of the inner side of the plate the mesocone (*m*) arises, usually bending forward as far as the posterior edge of the basal-plate or further. In my figures the overhanging portion of the cusp is shaded for the sake of greater distinctness. At the posterior outer margin of the basal-plate the ectocone (*e*) rises, also bending backward. The bases of the two cusps are generally connected by a ridge on the face of the basal-plate (*r*), but sometimes this is indistinct or wanting. The cusps are both long, though the ectocone stands so erectly that in a view from above it is much foreshortened. These structures are sufficiently shown in figures 1, 5 and 6 of plate 60.

The central row of the radula consists of teeth decidedly narrower than the others, and having a single, simple cusp. The side teeth are all of the same form fundamentally, as described above, merely decreasing in size and becoming shorter towards the lateral borders of the lingual band; some of the outer teeth usually distorted, being inclined obliquely inward. The cusps are very broad, blunt and rounded distally, and the sides of the reflected portion usually overhang the peduncle somewhat. The modification of the radula in the subgenera *Urocoptis, Cochlodinella, Idiostemma, Maceo* and the several sections subordinate to Gongylostoma, is not great. In some forms there are many, in others few teeth in a transverse row, and when few, the teeth diminish rapidly in size, and especially in length, giving the row an irregular appearance. These minor modifications are shown in the figures of plates 60 and 61, and are described below. The chief peculiarities of the radula are the *wide separation of ectocone from mesocone,* the *total absence of any indication of an entocone,* even on the outer teeth, the narrowness of the central teeth and the absence of side cusps thereon, and the obliquity of the transverse rows.

Subgenus Urocoptis. In all the Jamaican forms the central tooth is very narrow. Laterals numerous and similar, the formula being 14.1.14 = 29 in *U. lata manchionealensis* (pl. 60, figs. 1, 2, 3); fig. 1 representing a lateral tooth in profile. In *U. sanguinea,* Fischer found 12.1.12 x 115 teeth; in *U. brevis,* 10.1.10 x 103. In the section *Bactrocoptis, U. rosea montana* (pl. 60, fig. 4) has 13.1.13 teeth, like those of the larger species.

In *U. poeyana* (pl. 61, fig. 19), belonging to the subgenus Cochlodinella, the radula is very small, with 10.1.10 teeth, the middle tooth comparatively wide, its cusp as large as the ectocone of the adjacent lateral. In this respect the radula resembles that of *Gongylostoma* and *Autocoptis,* and differs conspicuously from that of Jamaican *Urocoptis.*

Subgenus Autocoptis. The teeth of *U. sericea* (pl. 50, figs. 9, 10) resemble those of *Cochlodinella* and *Gongylostoma* in the lengthened mesocones, comparatively large ectocones, and wide teeth of the central row.

In the subgenus ARANGIA the radula is unknown.

Subgenus IDIOSTEMMA. In *U. perlata* (pl. 61, fig. 18) the formula is 9.1.9; in *U. lateralis* (pl. 61, fig. 17), 8.1.8. In both the central tooth is quite narrow, its cusp decidedly smaller than the ectocones of the adjacent lateral teeth. The mesocones of the outer teeth are very oblique in *U. perlata*. The number of teeth in a transverse row, 17 to 19, is less than in any other group of *Urocoptis* except some forms of *Gongylostoma*. In the section *Maceo, U. interrupta* has 8.1.8 teeth, like those of *U. lateralis* in form.

Subgenus GONGYLOSTOMA. In *U. elegans,* the type of the subgenus, there are 12.1.12 teeth (pl. 60, fig. 8, *U. e. auberiana*). The central teeth are wide, as in *Cochlodinella poeyana* and the other species of *Gongylostoma,* their cusps about as large as those of the ectocones of the adjacent laterals. All of the cusps are very large and broadly rounded.

In the section *Pycnoptychia,* Binney found 8.1.8 teeth in *U. humboldtiana,* and Fischer reports 14.1.14 in *U. scæva.* If correct, this indicates that the two species are less closely related than their conchological characters indicate.

In section *Esochara, U. fabreana* (pl. 61, figs. 13, 14) has 10.1.10 teeth. They resemble those of *U. elegans* in form, but are larger than in any other *Urocoptis* examined. The centrals are narrower than in related groups.

U. ornata, the sole species of section *Sectilumen,* has 8.1.8 teeth in the specimen I examined (pl. 61, fig. 16), 9.1.9 in that figured by Binney. Except in diminishing more rapidly in size, the teeth do not differ materially from those of *U. elegans.*

In section *Liocallonia, U. vincta* (pl. 63, fig. 1) has 12.1.12 teeth, closely crowded and regular, with large cusps. Except in standing closer, and diminishing in size only in the outermost 3 or 4, they are not unlike those of *U. elegans.* The radula of *Liocallonia* as well as the shell is less specialized than in *Callonia.*

In *U. dautzenbergiana* (pl. 60, fig. 9) of the section *Callonia,* the teeth differ from those of *U. elegans* in having the cusps narrower distally, ovate as seen from above. There

are 9.1.9 teeth. In *U. elliotti* Fiseher found 14.1.14 teeth. They decrease rather rapidly in size towards the edges of the ribbon, as in *Idiostemma.*

In the seetion *Tomelasmus, U. sauvalleana* has 20.1.20 teeth, very regular and slowly decreasing towards the edges of the radula, mueh as in typical *Urocoptis.*

U. pruinosus (pl. 61, fig. 15) has 12.1.12 teeth, not materially unlike those of *U. elegans,* but the cusps are a little narrowed, as in *U. dautzenbergiana.*

In *U. ventricosa* (pl. 60, figs. 5, 6, 10) the formula is 9.1.9. Teeth formed as in *pruinosus,* but of eourse decreasing more rapidly.

In the slender, long, *Brachypodella*-like *U. wrighti* of eastern Cuba (pl. 61, fig. 12) there are 9.1.9 teeth, shaped like those of *U. ventricosa* exeept that the outer ones are more oblique and shorter. In *U. baculum* (pl. 60, fig. 11) the radula is even narrower, teeth 7.1.7, the two outer on each side rudimentary and very oblique, and there is a somewhat abrupt deerease from the seeond to the third lateral, to some degree approaching the condition of the less modified forms of *Brachypodella.* The centrals are rather wide, as usual in *Gongylostoma.* Further notes on the teeth of slender speeies may be found under *Cochlodinella* and *Tomelasmus* (pl. 63).

From the above it will be seen that the greatest modifieation of the radula is found in *Idiostemma, Callonia* and certain species placed in *Tomelasmus,* sueh as *U. ventricosa* and *U. baculum.* In these forms there has been extensive reduction in the number of teeth in a transverse row. This reduction is not correlated with either a partieular shell-eontour or axial seulpture, though it aceompanies, in most eases, highly evolved and variously aberrant shells. The several forms in which the tooth-formula has been specialized by reduction are not closely related. The tooth-reduction must be looked upon as a secondary modification undergone by several phyla.

The eentral tooth is very narrow in the Jamaican subgenus *Urocoptis;* rather narrow in *Idiostemma,* and comparatively wide in the subgenera *Gongylostoma, Cochlodinella* and *Autocoptis.*

Compared with *Holospira, Urocoptis* shows many important differences in the soft anatomy, besides the divergence in jaw and dentition already exposed by Fischer and Crosse. The free retractor muscles differ in the much shorter union of the right ocular and columellar bands in *Urocoptis,* while the left and pharyngeal bands, united in *Holospira roemeri,* are independent in *Urocoptis brevis.* The penis has a normal retractor in *Holospira,* but in *Urocoptis* its annexation to the ocular band reminds one of the condition obtaining in many *Achatinidæ.*

I regret that I have not been able to obtain any of the larger species of Jamaica, Haiti or Cuba in condition for dissection. The above descriptions are based upon three specimens of the rather small *U. brevis,* kindly supplied alive by Mr. G. H. Clapp. The shell has to be removed with dilute acid, after which the manipulation is not difficult except for the tight coiling of the whorls.

Subdivisions of Urocoptis.

Subgenus UROCOPTIS Beck.

Central teeth of the radula extremely narrow; lateral teeth almost uniform in size and shape, only a few of the outermost shortened and diminished. Shell brown, pink or purple, *uniform,* or with a sutural band, regularly striate, the axis slender and straight or rarely thickened by a low, wide spiral cord. Jamaica.

Section *Spirocoptis* Pils. Shell rather large; axis distinctly twisted or encircled by a smooth, low, obtuse spiral plait. Type *U. sanguinea.*

Section *Urocoptis* Beck. Shell rather large; axis slender, straight and simple. Type *U. cylindrus.*

Section *Bactrocoptis* Pils. Shell small and slender; axis simple and thin. Type *U. rosea montana.*

Subgenus AUTOCOPTIS Pilsbry, 1902.

Central teeth of the radula wide, approaching the ectocones of the laterals in width. Shell rather large, capacious, the axis straight and simple, its base encircled in the last whorl

by a low ridge, sometimes united with the axis. Haiti. Type *U. monilifera.*

Subgenus COCHLODINELLA Pils. and Van.

Central teeth of the radula wide; laterals rapidly diminishing, their number reduced. Shell small, thin, with a slender, simple axis. Western Cuba. Similar to *Gongylostoma* in dentition, but the axis is a simple style. Type *U. poeyana.*

Subgenus ARANGIA Pils. and Van.

Shell lengthened,*carinate below,* the *axis with a strong median spiral lamella.* Eastern Cuba and Gonave Island. Type *U. sowerbyana.*

Subgenus IDIOSTEMMA Pils. and Van.

Central teeth rather narrow. Shell long, the axis encircled by a low double cord which is *obliquely nodose or ribbed,* or having *the nodes transformed into pairs of hooks.* Eastern Cuba. Type *U. uncata.*

Subgenus GONGYLOSTOMA Albers.

Central tooth of the radula rather wide, its cusp about equal to the ectocones of the adjacent laterals. Shell long, the axis encircled by a *thin sub-basal lamella, the edge of which is spinose or serrate,* at least in the earlier whorls; frequently with spiral lamellæ above the dentate one. Cuba, chiefly in the west. Type *U. elegans.*

Two groups formerly subordinated to *Urocoptis* belong elsewhere; *Amphicosmia* of Haiti standing with *Brachypodella,* while *Spirostemma,* a Jamaican group, is related to *Anoma* (*Lia*).

Subgenus UROCOPTIS Beck.

Jamaican forms with the central tooth of the radula very narrow, and the axis of the shell simple or weakly twisted.

Section *Spirocoptis* Pilsbry, 1902.

Urocoptis with the shell rather large and stout, the internal pillar distinctly twisted or with a single smooth obtuse spiral plait. Type *U. sanguinea* Pfr. Distribution, Jamaica.

This group differs from typical *Urocoptis* in the torsion of the columellar axis, a feature not hitherto noticed in Jamaican species. *U. brevis,* in which the pillar is slightly twisted, forms a connecting link between this line of evolution and the typical *Urocoptis.* Two species, *U. sanguinea* and *U. lata,* occur in the eastern half of Jamaica, and two, *U. amethystina* and *U. megachcila,* in the extreme west. (*Speira,* spire, and *koptein,* cut.)

1. Peristome free throughout. *U. lata,* no. 1.
2. Peristome adnate above.
   a. Blood-red or brown; 20 x 7 to 29 x 9½ mm. *U. sanguinea,* no. 2.
   b. Dark purple-brown or plum color; lip extensively adnate above; stouter, 24.5 x 8.7 to 28 x 10 mm. *U. megacheila,* no. 4.
   c. Dark red-brown with a dusky-purple subsutural belt; narrower, 23 x 6 mm. *U. amethystina,* no. 5.

Another species, *U. instabilis,* no. 3, is provisionally referred to this section. Its axis is unknown.

These snails live on the ground, among the scrub and dead leaves, and are of about the color of their surroundings.

1. U. LATA (C. B. Adams). Pl. 30, figs. 42-50.

"Shell very robust, cylindrical in the lower three-fourths, rapidly tapering above; wax color, with a dark brown line next below the suture; with excessively minute, crowded transverse [obliquely longitudinal] striæ; anterior spiral keel very prominent; apex not very broadly truncate, with the loss of — whorls; whorls remaining 8⅓, very narrow, slightly convex, with a lightly impressed suture. Aperture considerably produced beyond the penult. whorl, transversely elliptical; lip broadly reflected. Length .86 inch, breadth .33 inch." [21.5 x 8.3 mm.]

Jamaica: *John Crow Hills,* in the northeastern portion of Portland. Map 2, area no. 1.

Cylindrella lata AD., Contrib. to Conch. no. 5, p. 82 (1850). —PFR., Monogr., iii, p. 569.—SOWERBY, C. Icon., xx, pl. 7, f. 58.—*C. lata* var. *producta* C. B. AD., Contrib. no. 9, p. 161

(1851).—*C. rosea* Pfr., Johnson & Fox, Nautilus, v, p. 34 (July, 1891).—*C. bacquieana* Chitty (?), Henderson, Nautilus, viii, p. 19, no. 91.

Adams' original description is given above. The typical form of the species may be known by its rather obese form, somewhat suddenly contracting above, the very superficial sutures, the unusually strong, pinched-up, basal carina, and the peculiar internal pillar, shown in pl. 30, figs. 45, 49, 50. Within the last 4 whorls it is a stout column having a rather weak spiral trend; this becoming a strong twist in the fourth whorl from below. Above this the pillar abruptly becomes very slender, with but a slight twist. Other characters of note are the great solidity of the shell, its small and rather long neck and the irregular shape of half-grown shells (fig. 47).

Shells sent by Mr. Jarvis from Rodney Hall (pl. 30, figs. 42-45) and Moore Town (pl. 30, fig. 46), Portland, agree well with Adams' description. Specimens from the former locality measure 22.5 x 8.5 mm., whorls 8½; 20 x 7.8 mm., whorls 8¼; 16.8 x 6 mm., whorls 7, etc. The brown sutural band is often wanting. In Moore Town *lata* the apical whorls are smooth, similar to pl. 32, f. 82.

A slender variety (pl. 30, figs. 48, 49) from Rural Hill (Jarvis) has 8½ to 10 whorls, a nearly circular mouth, and the slender neck of the typical form. It is cylindrical and narrow, and the brown internal axis is more slender, but the thickened part extends a whorl farther up. Length 22, diam. 6.6 mm., with 10 whorls; length 19, diam. 6 mm., with 8½ whorls.

With some specimens of *lata* in the A. D. Brown collection there was a young shell, pl. 30, fig. 47, and pl. 32, fig. 80, in which the apex is costellate. I am now inclined to think that it belongs to some other species.

Var. *antonionis* nov. (pl. 30, figs. 51, 52). At Port Antonio the shells collected by Henderson and by Fox are decidedly narrower and more cylindrical, 22 x 7 mm., with 8½ whorls. The color is dingy reddish-yellow, darker at the suture, and the neck is not so long. The internal characters

differ somewhat, the pillar being large in the penult. and next earlier whorls, decidedly smaller in the next preceding (while in the obese form it is most strongly twisted there).

Var. *producta* C. B. Ad. Form "much more elongate, subconic. A specimen is 1.23 inch long and .34 inch broad" [*Ad.*]. Known to me by the above note only. It is larger than any form of the species I have seen, measuring about 30¾ by 8½ mm.

Var. MANCHIONEALENSIS nov. (pl. 29, figs. 35-37). There is also a small form of *lata* in the collection of the Academy, taken at Manchioneal, in western Portland, by Messrs. W. J. Fox and C. W. Johnson. It measures 17 x 6.3 mm., with 8 whorls. The pillar is unusually slender, but noticeably spiral, the curvature greater in the fourth whorl up, as usual. The apex (pl. 32, fig. 82) is smooth, and the early whorls are attenuate.

Subsp. ISCHNOSTELE nov. Pl. 30, figs. 53, 54.

Shell tawny with darker sutural border, in shape like the subcylindric forms of *U. lata,* from which it differs in being much thinner, with the internal column straight, slender and tapering. Length 24, diam. 8 mm.; length 22, diam. 7 mm. Special locality not known.

In this form the pillar resembles that of the typical species of *Urocoptis,* but in external characters it is identical with *lata,* so that I dare not separate it specifically.

2. U. SANGUINEA (Pfeiffer). Pl. 31, figs. 61-69.

"Shell rimate, truncate, ovate-cylindrical, solid, glossy, brownish blood-red; suture linear; whorls 10, subequal, a little flat, subareuately and closely rib-striate, the last whorl not free, obsoletely angular at the base, a little more strongly ribbed anteriorly. Aperture subvertical, orbicular; peristome white, scarcely continuous, broadly expanded, shortly reflexed, appressed above. Length 26, diam. 9, width of aperture with peristome 7½ mm." (*Pfr.*)

Jamaica (Pfr.): St. Catherine at Thetford near Bushy Hill (Jarvis); Bogwalk (Henderson); St. Andrew at Stony

Hill (Jarvis, Henderson); Portland, on the northern watershed, at Bellevue (Henderson). Map no. 2, area no. 4.

Cylindrella sanguinea Pfr., in Philippi's Abbild., etc., ii, p. 48, pl. 2, f. 15 (October, 1845); Monographia, ii, p. 371; iii, p. 568; Conchyl. Cab., p. 8, pl. 1, f. 18-20.—Gloyne, Journ. de Conchyl., xx, 1872, p. 35.—Crosse & Fischer, J. de C., 1870, pp. 9, 12 (radula, jaw).—W. G. Binney, Notes on Amer. Land Shells, in Ann. Lyc. Nat. Hist. of N. Y., xi, p. 34 (genitalia).—Sowerby, Conch. Icon., xx, pl. 2, f. 12.—Henderson, Nautilus, viii, p. 19, no. 85.—Bland, Amer. Journ. of Conch., iv, p. 186 (jaw).—*C. cylindra* Chem., Henderson, Nautilus, viii, p. 19, no. 84.

Pupa rosea C. B. Adams, Proc. Bost. Soc. Nat. Hist., ii, p. 102 (Feb., 1846).—*Cylindrella carnea* C. B. Ad., Contrib. no. 2, p. 22 [6] (Oct., 1849), with var. *cerina*.—?? *Urocoptis coarctata* Beck, Index Moll., p. 83, based upon Lister, Hist., xxi, 17.

Pfeiffer's description is given above, and his figures copied on pl. 31, figs. 61, 62, 63. The type was a more swollen form than that ordinarily encountered, and further differed in having 10 whorls, while the usual range is from 7 to 9. *C. carnea* C. B. Ad. is universally admitted to be the same species, but the name applies especially to the more slender and cylindric form shown in fig. 64.

The color varies from crimson or brownish-red to purplish or light yellowish-brown. Some of the specimens from Stony Hill are almost as purple as *U. cylindrus*. The striæ are rather widely spaced, separated by intervals of double their own width. The circle of the peristome is interrupted above for a short distance, the lip usually being brown-tinted; basal keel is inconspicuous or almost obsolete. The internal pillar is rather stout and *strongly twisted spirally* in the last four whorls, less so but still perceptibly twisted above. The spiral is stronger than in *U. megacheila* or *U. amethystina*.

Specimens from Bellevue (pl. 31, figs. 65, 66, 69) are rather large and somewhat swollen, and in color vary from purplish-red to pale brown, always with a dark sutural border. Extremes measure:

Length 26, diam. 8.3 mm., whorls 8½.

Length 20.5, diam. 7.8 mm., whorls 7½.

From Stony Hill, in St. Andrew (fig. 64), the shells are similar but dull purple, without the brilliant red coloring of many Bellevue examples, and the axial spiral is pereeptibly wider, less sharp.

Var. *cerina* C. B. Ad. At Bogwalk, on the Cobre River, in St. Catherine (pl. 31, figs. 67, 68), the shells are slender, eylindric and dull dark brown or pale brown, some with a slightly purple shade. There are 9½ to 10 whorls. The axial fold is strong and somewhat aeute.

Length 24, diam. 7 mm.

Length 21, diam. 6.5 mm.

Var. *meridionalis*. At Thetford, near Bushy Park, in the southern part of St. Catherine, a eylindrical red variety oecurs (pl. 31, fig. 70). The shell is eomparatively slender, usually with 9½ eonvex whorls. Internal pillar twisted as usual. Length 22, diam. 6.5 mm.

The largest speeimen of *U. sanguinea* I have seen measures 29 mm. long, 9½ wide, and has 9⅔ whorls.

Var. PERPLEXA (Vendryes). Pl. 34 a, figs. 11, 12.

"This variety was eolleeted at Water House, an abandoned sugar estate, now turned into a grazing pen and negro provision grounds, in the upper northern portion of the Liguinea plain, where the limestone hills of the Red Hills range begin to rise. The aperture is produced and the peristome is detaehed all round; whilst in the typical *sanguinea* the peristome above is elosely soldered to the body-whorl, and often so much attenuated at the point of attaehment as to form a thin film. The shell is of medium size and dark colored; there is a narrow line of a deeper tint than the ground eolor, but rather dingy, running next to the suture along the lower part of it and extending to within it. This form is very persistent in the locality mentioned." (*Vendryes*).

Cylindrella (*Thaumasia*) *sanguinea* Pfeiffer, var. *perplexa* VENDRYES, Nautilus, xv, p. 3, pl. 1, f. 11, 12.

3. U. INSTABILIS (Vendryes). Pl. 34 a, figs. 9, 10.

"Shell ovate-cylindrical, solid, rimate; color dark sanguineous, not unlike that of some specimens of *Cyl. sanguinea,* but the surface of *instabilis* exhibits in most specimens semihydrophanous, more or less wide, transverse patches sparsely and irregularly occurring, and apparently produced by some indistinct lesions of the very thin epidermis; spire describing a well-drawn-out ovate outline; apex broadly truncate with the loss of 6 to 7 of the earlier volutions, whorls remaining 7 to 8, almost entirely plain in some examples, or moderately convex in others, subarcuately, obliquely and closely costulate striæ; the last whorl not detached in some examples, and detached and produced in others, and generally more strongly sculptured than the penult. and other whorls, with a well-pronounced carina at the base; suture lightly impressed and submargined; aperture slightly oblique, circular in some examples or transversely narrowed in others; peristome slightly tinged with the prevailing ground color of the shell, well expanded all around and reflected, not continuous above, but attenuated or reduced to a mere film and appressed to the body whorl in some examples, or in others detached and continuous, and produced outward near the upper part of the right side of the aperture and with a sinus or notch on the produced part. Long., 24 to 25 mm.; diam. at middle of spire, 9 to 10 mm.; aperture with peristome appressed, 8 mm. high and wide; when produced and with peristome detached, 6 mm. high, and 6 to 7 mm. wide." (*Vendryes.*)

Jamaica: Phœnix Park, near the Monarque in the parish of Saint Ann; environs of Brown's Town in the same parish. (Vendryes.)

Cylindrella (*Thaumasia*) *instabilis* VEND., Nautilus, xv, p. 4, pl. 1, f. 9, 10 (May 1, 1901).

"In several of its characters this species is rather inconsistent. In specimens found side by side and manifestly of the same brood, some examples show strong affinities with *Thaumasia sanguinea,* others with *Thaumasia cylindrus,* others again with *Gongylostoma lata* (*?Thaumasia lata*), in so far that it becomes often very difficult to locate them deci-

sively. In the two species figured, one has the lip appressed, as in *sanguinea;* in the other it is detached and expanded towards the right side of the aperture and bears a notch or sinus. In one the sculpture is decidedly like that of *sanguinea,* in the other it is like that of *cylindrus,* but stronger. In specimens with the aperture but slightly produced and the peristome *uninterrupted* by attenuation and adhesion to the body whorl, or produced and *not* bearing a sinus, the resemblance to *lata* is very great." (*Vend.*)

Known to me by the original description and figures only. The internal column is unfortunately unknown. When examined it will doubtless throw light upon the obscure relationships of the form. It occurs in an area (map no. 2, area 17) where no other large *Urocoptis* has been noticed.

4. U. MEGACHEILA (Chitty). Pl. 31, figs. 57, 58.

Shell solid and strong, shortly rimate, oblong-cylindric, rapidly tapering above, *dark purple-brown or plum color,* with a darker band below the suture; finely striated. 7½-8½ whorls remaining, the last with a low basal carina. Aperture brown within, the peristome fleshy-brown, *very broadly* expanded and flatly reflected, discontinuous above, the ends being connected by a wide bluish or lilac-white parietal callus. Internal column stout, distinctly sinuous and grooved at the root within the penultimate and next earlier whorls, becoming slender and straight above.

Length 28, diam. 10 mm.; width of apert. with lip 9.7 mm.

Length 24.5, diam. 8.7 mm.; width of apert. with lip 8.7 mm.

Jamaica: *Moreland,* in Westmoreland (Jarvis), and *Endeavor,* near the southern border of Hanover (Chitty). Map 2, area no. 13.

Cylindrella megacheila CHITTY, Ann. of the Lyc. of Nat. Hist. of New York, vi, p. 155, pl. 5, f. 1, 2 (1855).—PFR., Monogr., iv, p. 692.—SOWB., C. Icon., xx, pl. 6, f. 54.—*Urocoptis megacheila* Ch., P. & V., Proc. A. N. S. Phila., 1898, p. 274.

A very distinct species, much stouter in figure than the

allied *U. amethystina,* and with a less strong spiral twist of the pillar than either that or *U. sanguinea.*

5. U. AMETHYSTINA (Chitty). Pl. 31, figs. 59, 60.

Shell shortly rimate, cylindrical, slightly and slowly tapering above, dusky red-brown with a blackish-purple belt below the suture, finely rib-striate, the striæ nearly straight. Whorls about 9½, somewhat convex, the last not free in front, with a low basal carina. Aperture subvertical, brown inside, the peristome broadly expanded and reflexed, adnate above, nearly white, rather thick. Internal column strongly twisted spirally in the penultimate and next earlier whorls, much less twisted in the next whorl upward, slender and straight above.

Length 23, diam. 6 mm.

Jamaica: *Moreland,* in Westmoreland, and *Endeavor,* in the adjacent part of Hanover. (Chitty.)

C. amethystina CH., Ann. Lyc. of N. H. of New York, vi, p. 156, pl. 5, f. 3, 4 (1855), with var. *cerina.*—PFR., Monogr., iv, p. 697.—SOWERBY, Conch. Icon., xx, pl. 2, f. 15 (not good).

This species resembles *U. megacheila* in color, but is more like the more cylindrical form of *U. sanguinea* in shape. The color is sometimes pale brownish with a dark sutural belt, and according to Chitty "a variety occurs of a waxy color, which I designate *C. amethystina* var. *cerina.*" The specimens figured were sent by Chitty. It has not been found by recent collectors.

Section *Urocoptis* s. str.

The typical forms of *Urocoptis* are moderately large, densely striate shells, in which the axis is slender and straight, *U. cylindrus* being the type. All are Jamaican. The species fall into three groups, of which that of *U. brevis* forms a connecting link with the preceding section.

1. Group of *U. brevis.* Rather small, oblong species with the summit rounded, axis a little sinuous or straight, the apex (in *U. brevis*) ribbed.

2. Group of *U. cylindrus.* Cylindric, moderate or large shells, with simple axis.

3. Group of *U. nobilior*. Turrite, tapering large species. They live on the ground among leaves, etc. *U. nobilior* occurs at Bogwalk in a talus of decomposed shaly rock, of which the shells are almost exactly the color.

The wide range of variation and the intergradation of geographically adjacent races, renders the definition of species exceedingly difficult. Clear definitions and easy "keys" cannot be expected where no sharp distinctions exist in nature. There has been a good deal of differentiation, so that in the areas where the divergence of the various forms is most accentuated, they seem to be fairly distinct as species go; but elsewhere a multitude of less divergent local forms occur, more or less uniting the several main races.

(*Group of U. brevis.*)

6. U. BREVIS (Pfeiffer). Pl. 33, figs. 96-99, 1-3, 10-12; pl. 32, figs. 76, 84, 86.

"Shell rimate, truncate, cylindric-ovate, the apex rounded, obtuse; very closely, obliquely rib-striate; pale brown, a little glossy. Whorls 7, flattened, the later ones subequal, the last whorl shortly free, the base usually very obsoletely carinate. Aperture circular; peristome broadly expanded and a little reflexed. Length 16½, diam. 7 mm.; diam. of aperture 5 mm." (*Pfr.*)

Jamaica: Widely distributed along the south coast, from St. Thomas to St. Elizabeth, and inland 6 or 7 miles, but not above 500 ft. elevation (*Jarvis*). Area 3 of map no. 2.

Helix brevis Fér. in Mus., according to Pfr.—*Cylindrella brevis* PFR., Symbolæ, i, p. 47 (1841); in Philippi, Abbild., i, p. 185, pl. 1, f. 1; ii, p. 49, pl. 2, f. 18; Monogr., ii, p. 371; Conchyl. Cab., pl. 2, f. 10-17.—ORB., Moll. Cuba, i, p. 182, pl. 12, f. 12-14.—DESH. in Fér., Hist., ii, p. 226, pl. 164, f. 10-12. —CROSSE & FISCHER, Journ. de Conchyl., 1870, p. 9, 12, pl. 3, f. 6 (jaw), pl. 5, f. 14.—GLOYNE, J. de C., 1872, p. 34.—BLAND, Amer. Journ. of Conch., iv, p. 186 (jaw).—JOHNSON & FOX, Nautilus, v, p. 34.—RUSH, Nautilus, v, p. 69, no. 118. —HENDERSON, Nautilus, viii, p. 19, no. 86 (except loc. Ocho Rios).—?*Clausilia torticollis* CROUCH, Illustr. Introd. to La-

marck's Conchology, p. 28, pl. 15, f. 3 (1827).—*Cyl. columna* var. *intermedia* C. B. Ad., Contrib. no. 2, p. 22.—*?C. bulbiformis* Sowb., Conch. Icon., xx, pl. 11, f. 103 (1875).

An abundant and well known species, readily recognized by the short shell, very strongly tapering apical cone, narrow truncation, and the much-expanded, trumpet-like peristome, which is thin and sharp-edged. The slender internal column is perceptibly twisted. The original description is given above, and the original figures copied, pl. 33, figs. 10, 11, 12.

The truncate portion consists of 5 or 6 attenuated whorls forming a nipple-like apex. *The first two whorls are vertically ribbed,* the riblets delicate and widely spaced; the following whorls are more closely and obliquely rib-striate (pl. 32, fig. 86, specimen from Cambridge, St. James).

Specimens from Rock Fort, near Kingston, are typical. Figs. 96, 97; pl. 32, fig. 76 (x 20), further illustrate this form, which varies in size from 13½ to 18½ mm. long; whorls commonly 7¾ to 8¾. Color dull light brown, varying to dull roseate, dull purple or white.

At Long Mountain, near Kingston (pl. 33, figs. 1, 2, 3), the size varies more:

Length 20, diam. 6.5 mm.; whorls 8½.

Length 17, diam. 5.2 mm.; whorls 8½.

Length 11.5, diam. 4.7 mm.; whorls 6¾.

At Cambridge Hill, St. Thomas, the shells vary less in size, and are glossy, with smooth, flat striæ.

Specimens from Round Hill, near Milk River, St. Catherine (pl. 33, fig. 99, pl. 32, fig. 84), are similar to those from Long Mt., but are more coarsely striate and less variable in size. An albino specimen is figured.

Cylindrella bulbiformis Sowerby (pl. 33, fig. 4) seems to be a specimen of *U. brevis* which has retained the apex to maturity. The original description follows: "Shell shortly fusiform, pink, very finely striated, ventricose; apical whorls contracted, middle convex, inflated, last narrow, notched, hardly unwound; aperture large, rather round; margin round." The habitat is unknown, and it may possibly prove to be a Haitian *Brachypodella.*

U. brevis has been reported from Falmouth (Trelawny) by Henderson as *Cyl. obesa* C. B. A. (Nautilus, viii, p. 19, no. 88). The specimens (pl. 35, fig. 59) agree with *U. brevis* in the shape, narrow truncation, trumpet-like aperture, fine striation and the weakly indicated basal keel. The color is dark brown, paler above, and white behind the thin-edged lip. I can find no character to separate them from *U. brevis;* and if there is no mistake as to the locality, the anomalous distribution may possibly be explicable as a case of colonization by the accidental transportation of living individuals with plants or goods. The locality is as far as possible removed from the known area of *U. brevis.*

Var. *obesa* (C. B. Adams). Pl. 33, fig. 95; pl. 32, fig. 78 (x 20).

"Differs from *C. brevis* invariably in having the raised lines comparatively very distant. It is limited to a small district, on both sides of which *C. brevis* is widely distributed." "Length .57 inch, width .235 inch" (*C. B. Ad.*).

Figures 95 and 78 are from a specimen from the author. This so-called variety occurs in several lots before me mingled with a very closely striate form, the var. *densestriata* of Adams (pl. 32, fig. 79, x 20). The form *obesa* has coarser, the form *densestriata* finer sculpture than typical *U. brevis;* but I do not attach much weight to these differences.

Pupa obesa (with var. *densestriata*) C. B. A., Proc. Bost. Soc. N. H., 1845, p. 15.—*C. obesa* and *C. densestriata* C. B. A., Contrib. to Conch. no. 2, p. 22.

Var. COLUMNA (C. B. Adams). Pl. 33, figs. 5-9; pl. 32, fig. 77 (x 20).

"Perhaps a variety of *C. brevis* Pfr., but the spire has rectilinear and almost exactly parallel outlines in its lower two-thirds or three-fourths; the shell is longer; the whorls are wholly flattened; the lip is more widely spread; and the striæ are as small as in the more finely striated varieties of *C. brevis.* Length .72 inch, breadth .22 inch [18, 5.5 mm.]; of another, length .575, breadth .18 inch" [14.4, 4.5 mm.] (*C. B. Ad.*).

Rock Fort, near Kingston (Johnson and Fox, figs. 9, 77); Hope River, farther eastward, 5 or 6 miles from Kingston (Henderson and Simpson, figs. 5-8).

Cylindrella columna Ad., Contrib. no. 2, p. 22 (Oct., 1849). —Pfr., Monogr., iii, p. 570.—Henderson, Nautilus, viii, p. 19, no. 89 (not no. 81).—*C. brevis* var. *intermedia* C. B. A., Henderson, Nautilus, viii, p. 19, no. 87.

A short, pillar-like form, typically quite easily distinguished from *brevis*. Even more frequently than in *brevis*, the peristome remains adnate above. It is common a few miles east of Kingston. At an old lime-kiln at Rock Fort the shells are about 13 mm. long, 4 to 5 mm. wide, with 7 to 9½ whorls, and chiefly brownish (figs. 8, 77). Specimens from Hope River (pl. 33, figs. 5-8) are much more variable in size:

Length 21, diam. 7.2 mm.; whorls 9½.

Length 17, diam. 6 mm.; whorls 9.

Length 11.5, diam. 4.3 mm.; whorls 7⅓.

All intermediate sizes are fully represented. The whorls are flat or slightly convex, and the color varies from gray-white to occasional pink shells.

C. columna "var. *intermedia* more resembles *C. brevis* in having the whorls a little convex; but the shell is longer than the type of *C. columna*, and the aperture is a little larger. Length .78, breadth .22 inch [19.5, 5.5 mm.]" (*C. B. Ad.*). This form seems to have very slight claims to varietal distinction. I would refer the specimens before me, so named by Adams, to *U. brevis*.

Var. abbreviata (Deshayes). Pl. 33, figs. 90-94.

One of the most cylindric of the genus; broadly truncate at the summit, the spire very obtuse; composed of 6 nearly flat whorls, very slowly increasing, and joined by a simple, superficial suture. The last whorl is very short, a little higher than wide, its length about two-thirds that of the spire, base very convex, bearing a narrow, obtuse angle, further down than in other species. The aperture projects forward but little, is entirely free, circular, white; peristome thin, sharp, and strongly reflexed. Surface covered with very fine, regular

oblique striæ. The shell is thin, semi-transparent, of a very pale whitish corneous-brown, the last whorl having a narrow, reddish-brown band at the base, its edges shading into the ground color of the shell. This zone, cut by the suture, generally ascends the preceding whorls, but never reaches the apex. Length 14, diam. 5 mm.

Cyl. abbreviata Desh., in Fér. Hist., ii, p. 226, pl. 164, f. 13-15.—Pfr., Monogr., iii, p. 565.

The locality of this form is unknown. In a tray of three specimens before me, one (pl. 33, figs. 93, 94) has the basal and suprasutural band as described by Deshayes; another has a dark band beneath the suture (fig. 94), while the third has no bands. It is doubtless a local race of *U. brevis*. Figs. 90-92 of pl. 33 are copied from Deshayes, from whose account the above description was taken.

7. U. ovata (Deshayes). Pl. 33, figs. 87-89.

"Shell somewhat acorn-shaped, oval, very obtuse at the summit, very broadly truncate, tapering at the ends. The spire is composed of 7 very flat whorls, united by a perfectly superficial and sometimes very obscurely margined suture. The last whorl is extremely short, its diameter is less than that of the preceding whorl. It is provided in front with a small, obtuse keel, a little compressed on each side. The aperture is entirely detached, is irregularly circular and projects obliquely forward. The thin and sharp peristome is strongly reflexed. The whole surface is covered with extremely fine striæ, very elegant by their regularity; they are obtuse and distinctly curved. They disappear on the ventral surface of the last whorl, to reappear on the back, but coarser and more spaced. The whole thin and semi-transparent shell is of a very pale, uniform rose color. Length 20, diam. 8 mm." (*Desh.*). Jamaica.

C. ovata Desh., in Fér., Histoire, ii, p. 227, pl. 164, f. 7-9.—Pfr., Monogr., iii, p. 565.

"Very closely related to *C. brevis* of Pfeiffer. It is distinct by several characters, and may be recognized at sight by the more swollen shape."

The information given by Deshayes is repeated above, and his figures are copied, pl. 33, figs. 87-89. These indicate a thin shell with weak basal keel, and it is doubtful whether this exact form has been identified, and even whether it may not prove to belong to the *brevis* chain of variations.

Var. SANCTAEANNAE nov. Pl. 58, figs. 65, 66; pl. 32, fig. 81.

American and Jamaican collectors have identified as *C. ovata* a species (pl. 58, figs. 65, 66) found along the northern coast in northern St. Ann and northeastern Trelawny, map no. 2, area 16. It varies from flesh-pink to light brown-pink, is somewhat barrel-shaped, *decidedly swollen, thick and strong.* The last whorl is shortly free, but more so than *U. brevis,* and it has a *rather strong basal keel.* 6½ to 7½ whorls remain, the apex being generally more broadly truncate than in *U. brevis.* The rounded aperture is wider than long, with a continuous, free, broadly expanded and well reflexed peristome, which is *noticeably thickened,* and rolled backwards at the edge, instead of being acute like that of *U. brevis.* The axis is rather stout, but not in the least twisted, thus differing from that of *U. brevis.* Specimens of average dimensions measure 17½ mm. long, 7½ wide, with 7 whorls; and length 19, diam. 7 mm., with 8 whorls. There is but little variation in size among the large series seen, from the Henderson and Jarvis collections. It extends eastward to Ocho Rios and Braco, St. Ann. The young stage is still unknown.

This form was recorded as *C. ovata* Desh? and probably as *C. brevis* Pfr., Ocho Rios, by Henderson, Nautilus, viii, p. 19, nos. 83, 86.

8. U. HENDERSONI n. sp. Pl. 35, figs. 55-58; pl. 32, fig. 83.

Shell cylindric or oval-cylindric, very solid, flesh-colored or rarely yellowish, sculptured with comparatively coarse rounded riblets narrower than their intervals. Spire moderately or but slightly tapering, broadly truncate. Whorls 7 to 7½, rather convex, the last shortly free in front, having a low but rather wide basal keel. Aperture transversely oval,

the upper margin being straightened; pale fleshy-brown inside. Peristome expanded, somewhat reflexed, somewhat thickened, whitish. Internal axis straight, stout and tapering within the last two whorls, slender above.

Length 16.4, diam. 5.7 mm.; whorls 7½.

Length 15, diam. 5.7 mm.; whorls 7.

Jamaica: St. Ann's (Henderson & Simpson).

Cyl. striata Chitty (?), Henderson, Nautilus, viii, p. 19, no. 82.

This species is related to *U. ovata sanctæannæ*, but differs in being much more slender and more coarsely ribbed. *U. gravesii* has a more slender neck and is very minutely sculptured.

A large series was collected by Mr. J. B. Henderson, Jr., in 1893-4. The fully adult shell seems to lose, in many cases, all of the tapering whorls, as in fig. 58; but most of the specimens taper somewhat above, though less than in *U. gravesii*. The smallest specimen measured is 14.5 mm. long, 4.8 wide, with 7½ whorls; the widest is 6 mm. in diam., with a length of 15. The enlarged figure of sculpture (pl. 32, fig. 83) shows how strongly it differs from *U. ovata sanctæannæ* (fig. 81), or *U. brevis* (fig. 76). The sculpture of *U. obesa* (fig. 78) is almost equally coarse, but less strongly in relief. All of these figures are enlarged 20 diameters.

Group of U. gravesii.

9. U. gravesii (C. B. Adams). Pl. 33, figs. 14-17.

Shell cylindric-fusiform, solid and strong, *gray-white,* glossy, sculptured with close, fine, regular, smooth, straight striæ. Whorls 7 to 11, but slightly convex, the last free in front, with a *very weak basal keel or none.* Aperture subcircular, the peristome broadly expanded and reflexed, *somewhat trumpet-shaped.* Internal column straight and simple.

Length 22.5, diam. 6.3 mm.; whorls 9.

Length 18.5, diam. 5.5 mm.; whorls 8.

Length 16.5, diam. 5 mm.; whorls 7¾.

Length 15.5, diam. 5.3 mm.; whorls 7.

Jamaica: St. James and Trelawny parishes, along the coast from a short distance east of Falmouth to the neighborhood of Montego Bay, and 6 to 8 miles inland. Map no. 2, area 15.

Cylindrella gravesii C. B. A., Contrib. no. 2, p. 21 (Oct., 1849).—Pfr., Monogr., iii, p. 570; Conchyl. Cab., pl. 9, f. 6-8.—Sowerby, C. Icon., xx, pl. 3, f. 18.—Henderson, Nautilus, viii, p. 19, no. 90.

More slender than *U. ovata,* and distinguished from *U. dubia* and all of that group by its usually whitish color, and the more or less trumpet-shaped aperture. Figs. 16, 17 represent specimens from Adelphia, St. James (Jarvis). Messrs. Henderson and Simpson found it at Little River and Montego Bay, in the same parish. Some specimens from the last locality are tinted rose-brown.

The young shell (pl. 64, fig. 3, Montego Bay) tapers somewhat more regularly than *U. procera* and its allies, the deciduous portion consisting of about 15 whorls, the apical 2½ smooth.

10. U. transparens (Pfeiffer). Pl. 33, figs. 13, 18, 19.

Shell deeply rimate, cylindric-turreted, very closely subarcuate-striate, transparent, alabastrine; spire noticeably attenuate; suture hair-margined. Whorls remaining 7, moderately convex, the last rounded, very obsoletely angulate, free in front for a somewhat long distance. Aperture slightly oblique, somewhat irregularly rounded, narrowed by a slight columellar fold in the throat; peristome continuous, reflexed throughout, somewhat flexuous, white. Length 18½, diam. 6½; aperture with peristome 5 mm. long, 5¼ wide (*Pfr.*).

Jamaica (Bland). Mt. Diablo (Jarvis, Henderson). Map no. 2, area 6.

C. transparens Pfr., Malak. Blätt., xiii, 1866, p. 87; Monogr., vi, p. 369; Novit. Conch., p. 432, pl. 97, f. 3, 4.

Pfeiffer's original description is given above, and his figures are copied, pl. 33, figs. 18, 19. They indicate a shell related to *U. gravesii* and *U. procera.*

The Mt. Diablo shells referred to *transparens* (pl. 33, fig. 13) have narrower striæ than *U. gravesii,* the intervals double

the width of the riblets. They are white, with the basal keel very weak in some shells, but rather strong in others. Specimens measure:

Length 21, diam. 6 mm.; whorls 8.

Length 18, diam. 6 mm.; whorls 7.

Length 18½, diam. 6.2 mm.; whorls 7⅓.

11. U. ASPERA (C. B. Adams). Pl. 29, figs. 38-41; pl. 32, fig. 85.

Shell shortly rimate, oblong-cylindric, *strongly tapering above, the truncation quite small;* solid and strong, dull red or flesh-colored, usually paler on the lower whorls, the last one sometimes nearly white. Surface *lustreless,* sculptured with *sharp narrow, arcuate striæ, more widely spaced than usual* in allied species. Whorls typically 9 to 10, somewhat convex, the last tapering downwards, obtusely subangular around the axis, and encircled by a distinct or weak cord-like carina, becoming free in front. Aperture whitish within; peristome free and entire, broadly expanded and reflexed, *the upper margin noticeably straightened,* elsewhere rounded. Internal axis slender and straight.

Length 23.5, diam. 7.5 mm. (Adams' type).

Length 25, diam. 7.7 to 8.2 mm.; whorls 10. Yallahs R.

Length 20, diam. 7.2 mm.; whorls 9. Yallahs R.

Length 22, diam. 7.2 mm.; whorls 9½. Yallahs R.

Length 19, diam. 6.3 mm.; whorls 9½. Creighton Hall.

Length 21.5, diam. 7.2 mm.; whorls 9½. Creighton Hall.

Length 19, diam. 7 mm.; whorls 8⅓. Greenhall.

Jamaica: *Yallahs River* (Henderson), *Greenhall* and *Creighton Hall* (Jarvis), St. Thomas, from the coast to 1800 ft. elevation. Map no. 2, area 2.

Cylindrella aspera C. B. A., Contrib. to Conch., no. 2, p. 21 (Oct., 1849).—PFR., Monogr., iii, p. 564; Conchyl. Cab., p. 13, pl. 2, f. 18, 19.—HENDERSON, Nautilus, viii, p. 19 (June, 1894). —SOWB., C. Icon., xx, pl. 1, f. 1.

Probably Yallahs River (figs. 38, 39, 85) was the type locality, as specimens from that place agree perfectly with the original description. Those from Greenhall (figs. 40, 41) are

shorter, more pupiform, and with decidedly more widely spaced striæ.

Group of U. cylindrus.

Rather broadly truncate, large, and often beautifully colored forms, with simple, straight internal pillar (pl. 41, fig. 76, *U. ambigua* var. *magna*), the peristome normally free above, the striation fine and close.

These forms are distributed throughout the interior of the western half of Jamaica eastward to Clarendon. The several races, though given specific rank, are only nominal species, as intergradation closely connects the whole series. It is often a very difficult matter to tell where to place some specimens—indeed it becomes merely arbitrary where the characters of two forms are about equally mingled. There are no natural lines of demarcation. The nominal species are typically characterized as follows, beginning with the easternmost:

No. 12. *U. procera:* Shell rather slender, tawny (or sometimes pink); basal keel strong.

No. 13. *U. dubia:* Shell slender and small, dingy rose tinted; basal keel weak.

No. 14. *U. ambigua:* Shell stouter, roseate or rose-brown; basal keel short, weak. Length 19-26 mm., three times the diam.

var. *fortis:* Shell wider, the diam. more than one-third the alt.; 25 x 9 mm.

var. *magna:* Much larger, solid, rose-colored; basal keel weak.

var. *elizabethensis:* Narrow and parallel-sided, whorls flattened. Diam. less than one-third the length.

No. 15. *U. cylindrus:* Shell thin, purple; basal keel strong.

var. *rubella:* Smaller, bright red.

No. 16. *U. zonata:* Shell brownish-pink or purple, with a white sutural band.

12. U. PROCERA (C. B. Adams). Pl. 29, figs. 21-24.

Shell shortly rimate, *slender,* the lower three-fifths cylindric, upper portion *slowly tapering,* the apex broadly trun-

cate; thin; "reddish or yellowish-brown;" surface but slightly shining or lustreless, very densely and finely striate. Whorls about 9½ (7½ to 11), slightly convex, separated by a well marked suture, the last whorl shortly free in front, having a strong spiral carina at the base, extending upon the lip. Aperture oblique, subcircular, the peristome white, expanded and reflexed, slightly guttered at the termination of the basal carina. Internal axis white, slender and straight.

Jamaica: Interior of Clarendon, the most strongly marked form very local, at *Teak Pen* and a few miles around, where it is abundant (Jarvis); but smaller forms extend westward to *Clarendon Park*, Clarendon, and *Peace River*, Manchester (Jarvis). Map no. 2, area 7.

Cylindrella procera C. B. A., Contrib. to Conch., no. 7, p. 102 (April, 1850).

More slender and lengthened than *U. ambigua*, and with *the basal keel more pronounced;* moreover, the typical *procera* is not rose-colored, but tawny. But the specimens from Manchester are in some cases difficult to separate from *ambigua*. The ranges of the two overlap, and there is probably pretty complete intergradation. The area marked for *procera* on the map defines only the more typical form, excluding the rather wide range westward of varietal modifications.

Figures 21, 22 represent typical specimens from Adams, exact locality unknown. At Teak Pen, in central Clarendon (pl. 29, figs. 23, 24), the shells are still longer:

Length 32, diam. 7.7, whorls 12.

Length 29, diam. 7.5, whorls 10½.

Length 24.7, diam. 6.5, whorls 10.

Color dull or rather dark red-brown; basal keel strong; internal pillar stronger and shell decidedly thicker than in the typical form.

At Clarendon Park, near the western edge of Clarendon, and at Peace River, Manchester, the shells are small, about 24 x 6.5 mm., with 8-9 whorls, a strong basal keel, and more or less roseate color.

The rejected spire consists of about 13 whorls, the first two smooth and glossy. The outlines are irregular, the spire

being a little contracted just below the smooth apex, and more so just before the beginning of the permanent whorls. Fig. 1 of pl. 64 is from a specimen in coll. of G. H. Clapp, retaining all but the first whorl; loc., interior Clarendon.

13. U. DUBIA (Chitty). Pl. 29, figs. 18, 19, 20.

"Of the *C. rosea* group. Shell ovate-conic, much elongated, dingy rose color; lip white; moderately coarse oblique striæ of growth; keel nearly obsolete; last whorl very much rounded, and brownish; spire with convex outlines; apex truncate, with the loss of — whorls; 7¾ whorls left, very convex and rather shouldered, with a deeply impressed suture; last whorl moderately produced, subangular on the right side and at the upper part of the left. Aperture large. Lip spreading much on the left lower extremity, thin shining and slightly reflected. Length .67, breadth .17, breadth of lip .17 inch." (*Chitty*).

Jamaica: Parish of St. James, near Maroon Town (Chitty, Jarvis), and at Montpelier (Henderson); Mackfield, Westmoreland (Jarvis).

Cylindrella dubia CHITTY, Contrib. to Conch., no. 1, p. 13 (October, 1853).—PFR., Monogr., iv, p. 697.

Distinct from *ambigua* by its smaller size and especially the more slender form. Specimens from Maroon Town and Hanna Rock, five miles distant (pl. 29, figs. 18, 19), vary widely in size:

Length 16.5, diam. 4.3 mm.; whorls 7½.

Length 15, diam. 5.5 mm.; whorls 6½.

Length 21.3, diam. 5.6 mm.; whorls 8½.

Length 20, diam. 6.2 mm.; whorls 7½.

The mouth is almost circular, the upper margin of the lip being more arcuate than is usual in *U. ambigua*. The whorls vary a great deal in convexity, but are often more convex than in *U. ambigua*. The basal keel is weak or almost wanting, and in the form from around Maroon Town it is not strengthened just behind the lip, as it generally is in *ambigua*.

A large series collected by Henderson and Simpson at Montpelier, on the western border of St. James, is less variable in

size and shape than the Maroon Town shells, conforming to a narrowly cylindric type, about 21 by 5.7 mm. A few stragglers have been taken with the small form of *U. zonata*, at Mackfield, Westmoreland, by Mr. Jarvis (fig. 30).

The area no. 14 on map 2 is the metropolis of *U. dubia*, but according to Mr. Jarvis it occurs in small numbers a good distance from this center.

14. U. AMBIGUA (C. B. Adams). Pl. 29, figs. 25-32.

Shell cylindric, moderately tapering above, rather widely truncate, thin, but usually stronger than *U. cylindrus; rose-pink or pink-brown.* Surface usually shining, finely and closely, obliquely striate. Whorls 7-10, varying from slightly to distinctly convex, the last whorl shortly free in front, *rounded beneath*, except behind the lip, where there is a short keel. Aperture transversely oval, the peristome continuous, whitish or isabelline, expanded and reflexed, the upper margin straightened. Internal pillar slender and straight or nearly so.

Length 23.6, diam. 7.4 mm.; whorls 9⅓. Williamsfield, Manchester.

Length 20, diam. 7.5 mm.; whorls 6¾. Williamsfield, Manchester.

Length 19, diam. 6.5 mm.; whorls 7¾. Williamsfield, Manchester.

Length 26, diam. 8.5 mm.; whorls 8. Pratville, Manchester.

Length 18.5-20.5, diam. 7 mm.; whorls 7. Mandeville, Manchester.

Jamaica: N.-W. Clarendon and southern Trelawny, Manchester and St. Elizabeth parishes. Map no. 2, area 8, 8 a and 8 b, but far more abundant in area 8.

Cylindrella ambigua C. B. A., Contrib. no. 2, p. 21 (Oct., 1849).—*C. rosea* var. *ambigua* C. B. A., Contrib., p. 183, no. 174 *d* (1851).—*C. rosea* Chemnitz, SOWERBY, Conch. Icon., xx, pl. 2, f. 11.—*C. rosea* Pfr., DESHAYES, in Fér., Histoire, p. 225, pl. 164, f. 4-6 (enlarged).—HENDERSON, Nautilus, viii, p. 19, no. 94; and of Jamaican and American collectors gen-

erally.—*C. rosea* v. *fortis* C. B. A., HENDERSON, Nautilus, viii, p. 19, no. 95.—*C. rosea* var. *fortis* C. B. A., Contrib. no. 9, p. 161 (1851).

The following references to "*C. rosea*" probably pertain to the present species: Amer. Journ. Conch., iv, p. 186; v, p. 37 (jaw figd.); Ann. N. Y. Acad. Sci., iii, p. 125; Journ. de Conch., 1870, pp. 9, 12, 25 (teeth); Proc. Acad. Nat. Sci. Phila., 1873, p. 248; Beitr. Mex. Land- u. Susswasser-Conch., iv, p. 106, pl. 13, f. 6, 7 (teeth).

The name *C. ambigua* was originally given to a single abnormal specimen of the form known to Adams as *C. rosea*, but not the *rosea* of Pfeiffer. In view of the error regarding the identity of *rosea*, Adams' brief notices of *ambigua, magna, major* and *fortis* are quite inadequate for recognition, and none of the names would stand if the form had been elsewhere properly defined. But Pfeiffer considered the whole series to be mere varieties of *C. cylindrus;* and in the absence of a competing name, it seems best to adopt the first one on Adams' page, even though it was based upon a pathologic individual.

U. ambigua differs from *U. cylindrus* in the rose instead of purple color, the usually far weaker basal keel, and the somewhat stronger shell; but all of these characters vary within wide limits, so that there is no sharp line of demarcation between them.

Mr. Jarvis distinguishes three races of *U. ambigua:* (1) the typical small form described above, which is found throughout the areas 8, 8 *a*, 8 *b* of map 1, but is far more common in Manchester, area 8. This form measures from 18 to 26 mm. long, and varies from a dull brown tint, scarcely perceptibly rosy (Mandeville, fig. 30), to a bright rose (Pratville, pl. 28, figs. 16, 17). The shells from Mandeville and those from Williamsfield, in Manchester (pl. 29, figs. 28, 29), are typical.

A form apparently referable to typical *U. ambigua* (pl. 29, fig. 27) occurs at Great Valley Estate, Hanover (C. B. Taylor), in the area of *U. zonata.* The shells are a beautiful rose color. About 14 or 15 whorls are deciduous, the first 2½ being smooth. The earlier whorls are either pale or black.

The spire is shaped like that of *U. procera*. Pl. 64, fig. 2, is from a specimen in coll. G. H. Clapp.

There is a white form of this species (pl. 29, figs. 31, 32), but its locality is unknown to me.

At Spur Tree Hill, Manchester (Henderson), a form occurs (pl. 29, figs. 25, 26) varying in color from slightly olivaceous dull yellow to deep carmine-rose, the basal keel weak, as usual, often not developed on the first half of the base. A specimen measures 23.7 x 6.8 mm., whorls 8½. In color some of these specimens approach *U. procera*.

(2) Var. MAGNA (C. B. Adams). Pl. 28, figs. 1, 2, Spring Garden, Trelawny; fig. 3, Cowick Park, Trelawny; fig. 4, Aenon Town, N. border of Clarendon. Shell *large and solid,* of various shades of rose, whorls about 8, *convex,* the last with a *faintly indicated keel only,* rarely distinctly developed, and sometimes scarcely visible.

Length 31, diam. 10 mm.; whorls 8. Spring Garden.
Length 31.5, diam. 8.7 mm.; whorls 8½. Spring Garden.
Length 29.5, diam. 9.5 mm.; whorls 7½. Spring Garden.
Length 30.5, diam. 11 mm.; whorls 7½. Aenon Town.
Length 33.6, diam. 10 mm.; whorls 9. Cowick Park.

C. rosea var. *magna* and var. *major* C. B. A., Contrib. no. 2, p. 21.—*C. cylindrus* Chemn., in part, PFR., Conchyl. Cab., pl. 1, f. 26, 27.—SOWERBY, C. Icon., xx, pl. 2, f. 9 *a*, 9 *b*.

This race includes *C. rosea* var. *major* C. B. A. It inhabits the high mountain region of the central part of the island, area no. 8 b of map 2. Besides the localities mentioned above, specimens also collected by Mr. Jarvis are before me from Mile Gully, Manchester and Maroon Town, St. James. Possibly those from the latter locality may be referable to *U. zonata*, as the shells are solid, brown with a pale sutural border, and a rather strong basal keel; but the place is eastward from the well established range of *zonata*.

The more solid shell, roseate color and weak basal keel separate this variety from *U. cylindrus*.

C. B. Adams' original descriptions (!) follow:

"*Cylindrella rosea* Pfr. var. *magna* Ad. Length 1 inch; breadth .34 inch.

"*Cylindrella rosea* Pfr. var. *major* Ad. Length 1.3 inch; breadth .45 inch.

"*Cylindrella rosea* var. *fortis*. Shell as long as var. *major*, but with less diameter and more cylindric."

The variety FORTIS C. B. Ad. (pl. 28, fig. 5) is intermediate between *ambigua* and *magna* in form and size. The figured specimen (no. 33 c, coll. J. B. Henderson, Jr.) was from C. B. Adams. It has the usual weak basal keel, and measures, length 25.5, diam. 9.2 mm., and has 7½ whorls. A series of similar shells in the collection of the Academy indicates that it is probably a local race; but the locality is unknown.

(3) Var. ELIZABETHENSIS Pils. & Jarvis. Pl. 29, figs. 33, 34, Bogue Estate, near Balaclava, St. Elizabeth, *Jarvis*. Shell narrow and *cylindric*, the sutures scarcely impressed, *whorls nearly flat*.

Length 25, diam. 7.3 mm.; whorls 8. Bogue Estate. Type.

Length 22.3, diam. 7 mm.; whorls 8¾. Hermitage, St. Elizabeth.

Length 26, diam. 8 mm.; whorls 8½. Hermitage, St. Elizabeth.

This race is commonest in area 8 a of map 2, in St. Elizabeth.

15. U. CYLINDRUS (Chemnitz, Desh.). Pl. 28, figs. 6, 7, 8, 9.

Shell cylindric, slowly tapering above and very broadly truncate; *thin; dark purple, sometimes with a bluish "bloom" like that of a plum*, or varying toward rose-purple; the surface glossy, often with a silken lustre from the fine, smooth, close and even striation. Whorls 7½ to 9, moderately convex, the last free in front, usually with *a strong, cord-like basal keel*, and conspicuously swollen at the shoulder, behind the aperture. Aperture oblique, transversely oval, the peristome Isabella tinted, expanded and broadly reflexed, the upper margin much less curved than the other margins, a shallow gutter at the junction of the right with the basal margin. Internal axis very slender and straight.

Length 27, diam. 8.2 mm.; whorls 9. Hills behind Bluefields.

Length 23, diam. 8.3 mm.; whorls 7½. Hills behind Bluefields.

Length 31, diam. 9.6 mm.; whorls 9. Mulgrave.

Length 26.5, diam. 8.5 mm.; whorls 8. Mulgrave.

Length 21, diam. 7 mm.; whorls 7¾.

Jamaica: From the cockpit country in S.-W. Trelawny to the coast in eastern Westmoreland. Chiefly west of the area occupied by the rose-colored forms, and east of that of *U. zonata*. Map no. 2, area 11.

Turbo cylindrus CHEMNITZ, Conchyl. Cab., xi, p. 279, pl. 209, f. 2061, 2062 (1795).—DILLWYN, Descript. Catal., ii, p. 862 (1817).—*Helix cylindrus* WOOD, Index Testac., pl. 32, f. 113 *a* (copy from Chemn.).—*Pupa cylindra* GRAY, Ann. of Philos. (N. ser.), ix, p. 413.—*Pupa cylindrus* DESH. in Lam., An. s. Vert., viii, p. 194 (1838), and in Fér., Histoire, ii, p. 224, pl. 164, f. 1, 2, 3.—*Cylindrella cylindrus* Chemn., PFR., Symbolæ, ii, p. 136; in Phil., Abbild., i, p. 185, pl. 1, f. 2, and ii, p. 49, pl. 2, f. 11 (middle figure); Monogr., ii, p. 370; Conch. Cab., p. 6, pl. 1, f. 15-17.—GLOYNE, Journ. de Conchyl., xx, p. 35.—?*Pupa purpurea* auct. angl., GRAY, Annals of Nat. Hist., v, p. 244, name only (1840).—?*Cylindrella procera* Ad., SOWERBY, Conch. Icon., xx, pl. 2, f. 14 (1872).

This royal species is the first-described member of the group of large forms distributed throughout the interior of the western half of Jamaica. It differs from the large roseate forms chiefly in the stronger basal keel and the color, which, though subject to wide variation, is always more or less purple. The shell, moreover, is ordinarily much thinner, easily broken through with the point of a pen-knife, while the roseate forms are much stronger.

The figures and description of Deshayes first put the species upon a scientific basis. Figs. 6, 7 illustrate the typical form, the specimens being from Mulgrave, in N.-W. St. Elizabeth (Henderson). Figs. 8, 9 are a slightly more slender form from the hills behind Bluefields, on the south coast of Westmoreland. Shells from Withorn (Henderson coll.) are similar in shape, but of a finer purple color.

Sowerby's figures of *cylindrus* (C. Icon., xx, pl. 2, f. 9 *a*, 9 *b*) are probably *U. ambigua magna*.

Var. RUBELLA (C. B. Adams).

Related to *P. cylindrus* Desh., but the shell is smaller, brighter red; spire more slender above; whorls lost 14, 8 remaining; lip thin, free from the penultimate whorl. Length of truncated portion .43 inch; of remaining part .7, width .3 inch (*C. B. A.*).

Pupa rubella C. B. A., Proc. Bost. Soc. N. H., ii, p. 15 (1845).—*Cylindrella rubella* C. B. A., Contrib. to Conch., p. 39, no. 22; p. 183, no. 176.

This form has never been properly defined, and its status remains uncertain. Adams in his first Catalogue bracketed *rubella* with *cylindrus,* and in the Catalogue of 1851 placed it between *cylindrus* and *zonata,* in both cases separating it from the so-called *rosea* group of forms.

16. U. ZONATA (C. B. Adams). Pl. 28, figs. 10-15; pl. 30, figs. 55, 56.

"Shell cylindric in the lower two-thirds, very robust; pink with a tinge of brown or purple, with *a pearl-white zone along the suture;* pale brown in the aperture; with an elegant silky lustre produced by crowded, oblique, very fine striæ. Spire with the outlines convex in their upper half; apex truncate. Whorls remaining 8, moderately convex, slightly margined on the lower side, with a moderately impressed suture. Aperture similar to that of *C. rosea* [*ambigua*], but more dilated in the lower part of the left side, and with the lip less expanded. Length 1.18, breadth .41 inch." (*Adams*).

Jamaica: Interior of the parishes Hanover, Westmoreland and southwestern St. James. Map no. 2, area 12.

Cylindrella zonata C. B. A., Contrib. to Conch., no. 9, p. 161 (April, 1851.—PFR., Monogr., iii, p. 568; viii, p. 431.—SOWERBY, Conch. Icon., xx, pl. 2, f. 10 (1875).

"It resembles *C. cylindrus,* but differs in always having a white zone and in being often tinged with brown; it is much more robust. The aperture of *C. cylindrus* is more like that of *C. rosea* than of this shell." (*Adams*).

The internal pillar is moderately strong and nearly straight. A similar white sutural border is occasionally present in *U.*

ambigua var. *magna* and var. *elizabethensis.*

Fig. 56 of pl. 30 represents a specimen from Adams, of the typical pinkish-brown color; length 29, diam. 10 mm., whorls 7¾. Fig. 11 is a purple-pink specimen, length 26.5, diam. 10.2 mm., whorls 7½. According to Mr. Jarvis, the white sutural band becomes more distinct in shells from the western part of the range of the species.

Much smaller forms than those above noticed also occur. Figs. 13, 14, 15 represent a series from Mackfield collected by Mr. Jarvis. The shells are about 24 x 8 mm., with 7½ to 8 whorls. Color a warm reddish chestnut (fig. 15) varying to purplish pink-brown (fig. 14), the white band distinct, and to a clear amethyst-purple (fig. 13) with narrow sutural band, or even blue-purple, as in *U. cylindrus.* The purple forms at this place appear as stragglers among the much commoner pink-brown type. In everything but color the whole series is practically alike. A few much smaller shells, doubtfully referable to *U. dubia,* are also found with them, and I am somewhat disposed to consider them as merely small *zonata* (pl. 29, fig. 20).

From the Great Valley Estate, Hanover, a series collected by Mr. C. B. Taylor is before me (pl. 28, fig. 10). The shells measure, length 24, diam. 7½ to 8 mm., whorls 8. The color is reddish purple-brown, dark or moderately pale, the white band conspicuous. With them are specimens of a smaller, more slender shell, pink in color, with a faint whitish sutural band (pl. 29, fig. 27), which seem indistinguishable from the typical *U. ambigua,* though west of the ordinary range of that species.

Group of U. nobilior.

In *U. nobilor* the peristome is adnate above, in *U. bacquieana* it is free. Otherwise the two species are somewhat similar.

17. U. NOBILIOR (C. B. Adams). Pl. 31, figs. 71-75.

Shell shortly rimate, cylindric-tapering, *light yellowish-brown,* often slightly darker at the suture; shining, sharply

and finely, obliquely rib-striate. Whorls 8½ to 10½, somewhat convex, the last not free in front, with a distinct basal carina, stronger on the latter half. Aperture slightly oblique, subcircular, pale within; peristome white or light, broadly expanded and reflexed, adnate above. Internal pillar *slender and straight* within each whorl. Young shell very long, slender and gradually tapering, many-whorled, so that if retained to the adult stage the shell would consist of over 20 whorls.

Length 31, diam. 9 mm.; whorls 9⅓.

Length 34, diam. 9 mm.; whorls 10½.

Length 24, diam. 8 mm.; whorls 8½.

Jamaica: Northeastern part of St. Catherine, at *Bogwalk* (Henderson, Schumo, figs. 71, 72, 75) and *Natural Bridge*, Riversdale.

Pupa nobilior C. B. Ad., Proc. Bost. Soc. N. H., ii, p. 15 (1845).—*Cylindrella nobilior* Ad., Pfr., Monogr., iii, p. 567; iv, 696; vi, 365.—Henderson, Nautilus, viii, p. 19.—*Cylindrella binneyana* C. B. Ad., Pfr., in Philippi, Abbild., ii, p. 49, pl. 2, f. 11 (except middle fig.), 17; Monogr., ii, p. 373.—*C. nobilior* Adams, Sowerby, Conch. Icon., xx, pl. 6, f. 53.

A strongly marked species, always pale colored, and differing from other species with the peristome adnate, by its straight and slender internal column.

Cylindrella transaperta Sowerby (Conch. Icon., xx, pl. 9, f. 77, 1875) seems to differ from *U. nobilior* chiefly in the broader, less rounded aperture. It is thus described: "Shell broad, subcylindrical, brownish, very finely striated; permanent whorls 9 or 10, straight-sided, upper narrow; last rather square, with a long notch [rima]; aperture transversely oblong, inner lip touching, thick, white. The inner margin of the mouth touches the middle of the last whorl, across which it is extended." Habitat unknown. Type in coll. Sowerby. Pl. 3, fig. 25, is a copy of the original figure.

18. U. baquieana (Chitty). Pl. 35, figs. 39, 40, 41.

Shell cylindric-tapering, solid and strong, *dingy light yellowish with a dark dull red narrow border above and below the suture*, and a fainter reddish band above the basal keel;

finely and closely rib-striate. Whorls 9½ (8½ to 10), moderately convex, the latter half of the last having a *strongly pinched-up basal keel,* becoming free in front. Aperture subcircular, oblique, usually somewhat guttered at the position of the external keel; the peristome broadly expanded and reflexed, white or brown-tinted, more or less angular at the termination of the basal keel. Internal axis straight and simple.

Length 36, diam. 9½ mm.; whorls 9¾.

Length 29, diam. 9 mm.; whorls 8½.

Length 26, diam. 8 mm.; whorls 8⅓.

Jamaica: *Durham* (Chitty) and *Good Hope* (Jarvis), in southeastern Trelawny. Map no. 2, area no. 9.

Cylindrella adamsiana CHITTY, Contributions to Conchology [no. 1], p. 13 (October, 1853). Not *C. adamsiana* Pfr., 1851. —*C. baquicana* CHITTY, Ann. Lyc. Nat. Hist. of N. Y., vi, p. 156 (October, 1855).—PFR., Monogr., iv, p. 696; Conchyl. Cab., p. 10, pl. 9, f. 9, 10.

This species stands near *U. nobilior,* but it differs conspicuously in the continuous peristome, which is always carried forward free of the preceding whorl. The typical form is restricted in range to a small area near Ulster Spring, in southeastern Trelawny.

Subsp. PUDICA Pils. & Jarvis. Pl. 35, figs. 42-46.

Shell usually smaller, thin, dull rose colored, without a band at the suture; basal keel less strong than in *baquicana.*

Length 33, diam. 8.5 mm.; whorls 11½.

Length 31, diam. 9 mm.; whorls 8¼.

Length 26, diam. 8.7 mm.; whorls 8¼.

Southeastern Trelawny and southwestern St. Ann; types from Cave Valley, in the latter parish. Area no. 10 of map no. 2.

This form occurs over a much larger area than *baquicana,* Mr. Jarvis regarding the latter as a specialized local variety of this more widely distributed race. In one specimen of the type lot the peristome is shortly adnate above. The internal pillar is straight and simple. Figures 42-45 are from Cave Valley; fig. 46 is the form from Aenontown, in which the axis is thicker.

Section *Bactricoptis* Pilsbry, 1903.

Shell small, cylindric-tapering, finely striate, with the last whorl free, moderately keeled below. Axis simple and straight or slightly sinuous. Dentition as in the large forms of *Urocoptis*. Type *U. rosea* var. *montana*. (*Bactricoptis*, a cut stick.)

These snails occur in the mountainous interior of the western half of Jamaica, the region inhabited by the *cylindrus* group, to which they are closely related, differing so far as we know in little besides the greatly diminished size of the shell. The species were formerly placed in the Cuban group *Cochlodinella*, but the dentition proves that position to be erroneous, the very narrow central teeth, and numerous very slowly diminishing laterals, clearly showing the relationship with the other Jamaican forms of *Urocoptis*.

Key to Species.

1. Striation moderately fine, the striæ on the last whorl narrower than their intervals.
   a. Striæ quite arcuate; internal column twisted in the last 3 or 4 whorls; basal keel inconspicuous. *U. rosea*, no. 19.
   b. Striæ finer; internal column straight; basal keel strong. *U. hollandi*, no. 20.
2. Striation excessively fine and regular, the striæ as wide as the intervals.
   a. Somewhat variegated by streaks or patches; whorls 10 or 11. *U. hydrophana*, no. 21.
   b. Uniform pale brown or white, glossy; whorls 6 or 7. *U. pupæformis*, no. 22.

19. U. ROSEA (Pfeiffer). Pl. 34, figs. 24, 25, 26.

Shell cylindric-subfusiform, truncate, thin, diaphanous, rose-colored, very minutely obliquely striate. Whorls 10, a little convex, the last very shortly built forward, base obsoletely carinate. Aperture circular; peristome narrowly reflexed throughout. Length 16, diam. 5 mm.; aperture 3½ mm. wide (*Pfr.*). Jamaica.

Cyl. rosea Pfr., in Philippi, Abbild., i, p. 184, pl. 1, f. 3 (Dec., 1844); Monogr., ii, p. 374; Conchyl. Cab., p. 20, pl. 2, f. 31, 32. Not *C. rosea* of C. B. Adams and subsequent American authors and collectors.—*Cyl. montana* C. B. Adams, Contrib. no. 2, p. 20 (Oct., 1849).—Gloyne, J. de Conch., xx, p. 36.—Sowerby, Conch. Icon., xx, pl. 5, f. 44.—Henderson, Nautilus, viii, p. 19, no. 80.—*Cyl. striata* Chitty, Contrib. to Conch., p. 12 (Oct., 1853).

Pfeiffer's original description and figures are copied. The name *C. rosea* was transferred by C. B. Adams to a species of the *U. cylindrus* group, and the present species he described as *C. montana*. Subsequent American and Jamaican authors and collectors have followed this erroneous course. The type of *C. rosea* Pfr. was slightly larger than specimens ordinarily encountered, though the diameter given, "5 mill.," probably was measured to the outside of the outer lip. The type of *C. montana* measures 14.5 mm. long, 4.07 wide.

The species as ordinarily seen (pl. 34, figs. 22, 23, 27, 28) varies in color from a beautiful rose tint to brownish-rose and to white. The sculpture consists of regular, *strongly arcuate* riblets, separated by intervals of about double their width. The last whorl has a moderately conspicuous, wide, obtuse basal keel, with a slight depression along each side. The round aperture has a well-reflexed lip. The internal axis is distinctly spiral within the lower three or four whorls, straighter and more slender above (fig. 27).

Length 14.5, diam. 3.7 mm.; whorls 9½.

Length 14.5, diam. 4 mm.; whorls 9.

Length 15.5, diam. 3.4 mm.; whorls 10½.

Length 15.3, diam. 3.2 mm.; whorls 9½.

It occurs in the interior of St. Elizabeth, at Balaclava and Troy (P. W. Jarvis), and at Withorn (Henderson); Mandeville, under stones (Gloyne).

Var. striata (Chitty).

Like *montana*, etc. Shell short and thick, subovate; pure white, truncate apex deep gray. Coarsely set shining striæ, coarser than *C. hydrophana* and *C. montana*. Striæ arcuate.

Keel on the last whorl scarcely perceptible. Spire with convex outlines. Apex broadly truncate. Whorls left 9¾, very convex, not marginate; with a well-impressed suture. Aperture produced, as in all this class. Lip nearly orbicular, reflected and thickened. Length .61, breadth .16 inch. Habitat Burnt Hill Glade, Westmoreland (*Chitty*).

This seems to be a western race of Adams' *montana*.

20. U. HOLLANDI (C. B. Adams). Pl. 34, figs. 35-39.

"Shell rather slender, cylindrical in the lower three-fourths, slowly tapering above; wax color; with very minute crowded transverse striæ, and the anterior spiral keel not very prominent; apex rather broadly truncate, with the loss of — whorls; whorls remaining ten, subplanulate, with a well-impressed suture; aperture considerably produced beyond the penult. whorl, between orbicular and trapezoidal, slightly effuse by the canal within the anterior keel; lip well expanded, moderately reflected.

"Length .82 inch; breadth .18 inch." [20½ x 4½ mm.] (*C. B. Ad.*).

Jamaica: Balaclava, Ipswich and Troy, in the interior of St. Elizabeth (P. W. Jarvis); Mulgrave, near Ipswich (J. B. Henderson, Jr.).

Cyl. hollandi C. B. A., Contrib. no. 5, p. 82 (1850).—PFR., Monogr., iii, p. 570.—SOWERBY, Conch. Icon., xx, pl. 9, f. 76. *Cyl. augustæ* C. B. A., t. c., p. 83 (1850).—PFR., Monogr., iii, p. 571.—SOWERBY, Conch. Icon., xx, pl. 7, f. 63.

This species is usually larger than *U. rosea*, and its small variety, *montana;* is much more finely striate, has a more strongly projecting basal keel, and the internal column is straight. The color varies from red-brown to white, but it is usually light brown. Specimens measure:

Length 21.5, diam. 4.2 mm.; whorls 10½. Ipswich.

Length 15.5, diam. 4 mm.; whorls 8¼. Balaclava.

Length 19, diam. 4 mm.; whorls 10. Mulgrave.

Length 17.5, diam. 4 mm.; whorls 9⅓. Mulgrave.

The figures are from Ipswich specimens. In the series before me I do not find it practicable to separate *C. augustæ* from *hollandi*. The description follows:

C. augustæ. "Shell not very slender, cylindrical in the lower three-fourths, slightly tapering above; pale wax color; with very minute crowded transverse striæ; anterior spiral keel not very prominent; apex broadly truncate, with the loss of — whorls; whorls remaining nine, a little convex, with a well-impressed suture; aperture moderately produced beyond the penult. whorl, suborbicular, a little dilated at the left of the upper side; lip well expanded, moderately reflected. This species is allied to the preceding, and to *C. montana.*

"Length .65 inch; breadth .17 inch." [16¼ x 4¼ mm.] (*C. B. Ad.*).

At Comfort Hall, Trelawny, Mr. Jarvis found a form similar to *hollandi* in size and shape, but with the basal keel weaker and the striation finer, though not quite as fine as in *U. hydrophana.* Some specimens have the occasional dark striæ of *hydrophana.* It is an intermediate race.

21. U. HYDROPHANA (Chitty). Pl. 34, figs. 19-21, 29-31.

Shell cylindric, the upper half slowly tapering; broadly truncate; general color dingy brown, but under a lens *the striæ are whitish except for irregular patches and occasional narrow streaks,* where they are dark like the intervals. Surface glossy, the *striation very fine and regular,* striæ being much closer than in *U. hollandi,* and *as wide as the intervals.* Whorls 10 to 11½, but slightly convex, the last rounded below, with only a weak keel, shortly produced forward. Aperture somewhat oblique, circular; peristome expanded and reflexed, white, or brownish below, continuous. Internal axis straight.

Length 15.5, diam. 3.8 mm.; whorls 11½. Manchester.

Length 14.6, diam. 4 mm.; whorls 10. Manchester.

Length 15, diam. 3.5 mm.; whorls 10. Chitty's type.

Jamaica: Durham, ? Trelawny (Chitty); Manchester (coll. A. N. S.).

Cyl. hydrophana CHITTY, Contrib. to Conch., p. 12 (1853). —PFR., Monogr., iv, p. 699; Conchyl. Cab., p. 21, pl. 9, f. 3-5.

A rare species in collections, much more closely and finely striate than *U. hollandi,* and remarkable for its patches or streaks of darker striæ. Figs. 19-21 are from Pfeiffer, but fig. 29 shows better the fine striation and peculiar streaks.

22. U. PUPÆFORMIS (C. B. Adams). Pl. 34, figs. 32-34.

Shell cylindric-fusiform, the upper half tapering; thin but moderately solid; light brown or white; glossy, very regularly and *most minutely striate,* the striæ smooth, *as wide as the intervals,* moderately arcuate. *Whorls 6 to 7,* moderately convex, the last laterally compressed, its last half having a wide, bluntly rounded but rather strongly projecting basal keel; free in front. Aperture oblique, subcircular, the peristome expanded and broadly reflexed, white. Internal axis slender and straight.

Length 14, diam. 3.5 mm.; whorls 7.

Length 12, diam. 3.5 mm.; whorls 6¼.

Jamaica: Ft. William, Westmoreland (Jarvis); Mulgrave, St. Elizabeth (Henderson); Heavytree, in the extreme north of Manchester (Gloyne).

Cyl. pupæformis C. B. A., Contrib. no. 7, p. 102 (April, 1850).—PFR., Monogr., iii, p. 572.—SOWERBY, Conch. Icon., xx, pl. 16, f. 143.—GLOYNE, Journ. de Conch., xx, 1872, p. 35.

The small number of whorls, brilliant gloss and very fine striation are characteristic. The sculpture is even finer than in *U. hydrophana.*

Subgenus AUTOCOPTIS Pilsbry, 1902.

Shell rather large for the genus, the axis straight or moderately twisted, an accessory lamella (pl. 40, fig. 53) revolving about and continued beyond its lower termination, sometimes more or less completely united with the axis. Type *U. monilifera.* Distribution, Haiti. (*Autocoptis,* self-cut or truncated.)

The Haitian forms of the genus *Urocoptis* differ conspicuously from the Jamaican in general appearance, coloring, sculpture and the structure of the axial region within the last whorl. The nepionic sculpture is unknown. As a general rule, Jamaican species lose a far greater number of early whorls than Haitian, in most of which the summit tapers rapidly, and the truncation is narrow. The plug is in most species narrowly tongue-shaped (pl. 40, fig. 47), but in a few it is flat and steep (pl. 40, fig. 49). There are also some tran-

sitions between these two kinds. It is commonly not exposed, the open whorl persisting above it, while in Jamaican forms the whorl is generally broken down to the plug in adult individuals.

The radula (p. 109) differs strongly from that of the Jamaican species in the far greater width of the central teeth.

Key to Haitian Species.

I. Suture simple.

a. Rather large species, diam. 7-11, length 19-28 mm.

1. Diam. exceeding one-third the length; swollen, glossy, whitish and closely striate above, reddish or blue and coarsely striate below, dark brown inside. 25½-28 x 10-11 mm. *U. gruneri,* no. 32.
2. Diam. exceeding one-third the alt.; oblong, lustreless, flesh colored, finely, distinctly rib-striate throughout; peristome continuous and free. 25 x 9 mm. *U. guigouana,* no. 33.
3. Diam. equal to or exceeding one-third the length; riblets very strongly arcuate, stronger near the sutures; flesh colored. 19-23 x 7-8 mm. *U. arcuata,* no. 34.
4. Diam. about one-third the length, more or less; *weakly* striate; *glossy;* transparent-whitish, or brown above; peristome adnate above, or almost free. *U. sericea,* no. 31.

b. Small ovate-oblong species, length about 15, diam. 4 to 5 mm.

1. Clear reddish-brown, glossy, with close arcuate striæ and low spiral liræ; peristome continuous. *U. tumidula,* no. 35.
2. Brownish flesh-colored, closely thread-costulate, the riblets wavy; peristome continuous, in contact above. *U. innata,* no. 36.

II. Suture crenulate or with a bordering series of pits or bosses, sometimes very small, and on the upper whorls only.

a. Shell dull, sculptured with very fine waved or interrupted striæ, with a series of pits *above* the suture.

1. Basal keel very strongly projecting; peristome hardly expanded.
Archegocoptis eximia.
2. Basal keel moderate, cord-like; peristome well expanded. *Archegocoptis crenata.*

b. Shell widely truncate, glossy, striatulate, the middle whorls with a band. 30 x 11 mm., whorls 6.
U. truncata, no. 30.

c. Surface punctate, the earlier and last whorls striate.

1. Peristome adnate above; diam. about one-third the length; whorls 7½ to 9. 14-15 x 5-5½ mm., *U. adamsiana,* no. 26; 18-20 x 6-6½ mm., *U. a. puncturata.*
2. Peristome free; diam. less than one-third the length; no distinct accessory basal lamella. 28-31 x 8 mm., whorls 9-10.
U. malleata, no. 27.

d. Surface glossy, almost smooth or closely, finely striate; white with corneous or brown stripes.

1. Diam. one-third the length or less; suture crenate only weakly and on the cone; axis strongly twisted; peristome adnate above. 25-28 x 8 mm. *U. flammulata,* no. 28.
2. Diam. exceeding one-third the length; finely striate; axis nearly straight; peristome free or shortly adherent above. 30-32 x 10½-11½ mm. *U. menkeana,* no. 29.

e. Surface sharply sculptured with arcuate thread-like striæ, the suture conspicuously crenate; diam. about one-third the length. *U. monilifera,* no. 23; *U. klatteana,* no. 25; *U. rudis,* no. 24.

23. U. MONILIFERA (Pfeiffer). Pl. 40, figs. 49-54.

Shell fusiform or somewhat cylindric, usually widest above

the middle, the upper third strongly tapering to a narrow truncation; the terminal plug nearly flat and vertical. Surface lustreless, pale brown, streaked with white, sculptured with close, arcuate, thread-like white striæ, which unite by twos or threes into raised white nodules along below the suture. Whorls 8½ to 11, slightly convex, the last very shortly or not free in front, pinched into a very strong cord-like keel beneath. Aperture obliquely short-oval, angular at the outer-basal part, channelled within; the peristome continuous and free or barely in contact above. Internal axis somewhat twisted throughout; in the last whorl a spiral lamella revolves close to its root, extending more than a whorl inward, its lower end visible in the aperture as a low white fold.

Length 21, diam. 7.3 mm.; whorls 9.

Length 21.5, diam. 6.2 mm.; whorls 11.

Length 19, diam. 6 mm.; whorls 9 (Pfeiffer's type).

Haiti: Rep. of S. Domingo, at Azua and Las Charcas (A. Sallé); Rep. Haiti, at Thomazeau (Henderson & Simpson).

Cyl. monilifera Pfr., Zeitschr. f. Malak., 1850, p. 74; P. Z. S., 1851, p. 148; Conchyl. Cab., p. 10, pl. 2, f. 1-3; Monogr., iii, p. 568.—Crosse, Journ. de Conchyl., 1891, p. 140.

The suture is white-beaded below, and the end of the apical plug flattened, as in *U. adamsiana*, but the thread-like striæ and continuous peristome of *U. monilifera* readily differentiate the two species. The accessory basal lamella is much longer than in *U. adamsiana*. The empty whorl generally persists some distance beyond the terminal plug, which is usually not visible without breaking away a portion.

24. U. rudis (Weinland).

Shell rimate, truncate, slightly diaphanous, fleshy-whitish; irregularly and rudely crispate, with close, whitish, undulating, sometimes confluent striæ. Suture crenated with sparse, rather coarse lobules. Whorls remaining 9, rather flat, the last hardly narrower than the preceding, slightly produced, angulated by a compressed, denticulate keel. Aperture a little oblique, nearly circular, a little straightened

above; peristome white, continuous, a little expanded and a little reflexed throughout, appressed above. Length 18½, diam. 6 mm.; aperture with perist. 5 mm. long and wide (*Weinl.*).

Haiti: Republic of S. Domingo (Newcomb; in Bland coll.).

Cyl. rudis WEINL., Jahrb., d. D. Malak. Ges., vii, 1880, p. 358.

"This species also belongs in the group *Urocoptis,* near *C. tumidula* W. & M." (Weinl.). Systematic position doubtful. It has not been figured.

25. U. KLATTEANA (Weinland).

Shell shortly rimate, ovate-cylindrical, truncate, a little shining, closely and regularly arcuate-striate; whitish, irregularly and sparsely ornamented with longitudinal corneous streaks; suture little impressed, elegantly and closely crenulate. Whorls remaining 10, rather flat, the base provided with a narrow cord-like keel. Aperture slightly oblique, subcircular, somewhat channelled in the base; peristome continuous, white, a little expanded throughout, reflexed above. Length 22, diam. in the middle 6½, aperture with peristome 5 mm. long and wide (*Weinl.*).

Haiti: Port au Prince (Klatte; type in Bland coll.).

Cyl. klatteana WEINL., Jahrb. d. D. Malak. Ges., vii, 1880, p. 357.

"Belongs to the group *Urocoptis* Beck, near *C. adamsiana* Pfr." (*Weinl.*). It must resemble *U. monilifera* rather closely. The unique specimen has not been figured.

26. U. ADAMSIANA (Pfeiffer). Pl. 40, figs. 42-46, 48.

Shell cylindric-oblong, the upper third or fourth rapidly tapering; corneous, variegated with white in streaks and a fine net-work, and usually with a row of white raised spots below the suture. Frequently the upper half of the shell is roseate. Summit truncate. Surface glossy, densely punctate, the last whorl and earlier whorls irregularly rib-striate. Whorls usually 7½ to 9, flat, the last pinched into a strong basal keel. Aperture slightly oblique, rounded, the peri-

stome reflexed, its upper margin wholly adnate to the preceding whorl. Internal axis a moderately twisted, tapering column; within the right side and back of the last whorl it is encircled by a rather strong, obtuse lamella.

Length 15.5, diam. 5 mm.; whorls 8⅓.

Length 15.5, diam. 5.5 mm.; whorls 7½.

Length 19, diam. 6 mm.; whorls 9. *Puncturata.*

Length 20, diam. 6.2 mm.; whorls 8½. *Puncturata.*

Haiti: Charcas, in the Dominican Republic (Sallé); Barrera, in the same portion (Sallé, *C. puncturata*).

Cyl. adamsiana Pfr., P. Z. S., 1851, p. 148; Monogr., iii, p. 566; Conchyl. Cab., p. 11, pl. 2, f. 4-6.—Sowerby, Conch. Icon., xx, pl. 2, f. 16.—Crosse, Journ. de Conchyl., 1891, p. 140, pl. 4, f. 3. *Cyl. puncturata* Pfr., P. Z. S., 1852, p. 141; Conchyl. Cab., p. 12, pl. 2, f. 7-9; Monogr., iii, p. 567.—Sowb., C. Icon., xx, pl. 3, f. 24.—Crosse, J. de C., 1891, p. 141, pl. 4, f. 4.

Readily known by its adnate peristome, punctured surface, white-beaded suture and small size. Pfeiffer's *C. puncturata* has no distinguishing character except slightly greater size, the type measuring 18 mm. long, 6⅓ wide, with 9 whorls, while the original measurements of *adamsiana* were 14 to 15½ mm. long, 5 mm. wide, with 8 to 9 whorls. The specimens before me show no differences except in size.

27. U. malleata (Pfeiffer). Pl. 40, figs. 39, 40, 41, 47; pl. 41, fig. 59; pl. 38, figs. 8, 9, 10, 11.

Shell cylindric, the upper third or fourth tapering to the narrow, concave truncation, the plug long and tongue-shaped. Surface glossy, white, uniform or sparsely variegated with fleshy- or corneous-brown streaks, sculptured with regular, fine striæ on the terminal cone, with minute pits on the cylindrical portion, passing into striæ again towards the base of the last whorl. Whorls 9-10, but slightly convex, weakly crenate below the suture, the last whorl having a cord-like keel at the base, hardly free in front. Aperture rounded, channelled within at the position of the keel; peristome well reflexed, continuous and free. Internal column (pl. 41, fig. 59)

nearly straight, very weakly twisted, the short "accessory lamella" united with it.

Length 28, diam. 8 mm.; whorls 9.

Length 31, diam. 8 mm.; whorls 10 (Pfeiffer's type).

Haiti: Rincon Barahona, in the Republic of S. Domingo (A. Sallé).

Cyl. malleata Pfr., P. Z. S., 1852, p. 140; Monogr., iii, p. 567. —Sowerby, Conch. Icon., xx, pl. 16, f. 138.—Crosse, Journ. de Conchyl., 1891, p. 139, pl. 3, f. 4.—*C. menkeana* Crosse, t. c., pl. 3, f. 5 (?).

This species is much narrower than *U. menkeana,* and punctured instead of striate. *U. flammulata* is very closely related, but it is smoother, with the peristome adnate above.

28. U. FLAMMULATA (Pfeiffer). Pl. 41, figs. 55-58.

Shell subcylindric, the upper third or fourth tapering to a narrow truncation, terminal plug long and tongue-like. *Surface glossy, almost smooth,* except the latter part of the last whorl, the basal keel and the first whorl or two, which are striate. Color *brown or corneous-brown and white, in alternate stripes,* more or less irregular. Whorls 8 to 10, almost flat, the last having a cord-like keel beneath, not free in front. Aperture rounded, brown in the throat; peristome white, expanded and reflexed, *adnate above* for a short distance. Internal axis rather strongly twisted, dilated at its base in the last whorl.

Length 25, diam. 8 mm.; whorls 8.

Length 28, diam. 7.3 mm.; whorls 9.

Length 28, diam. 8 mm.; whorls 10 (Pfeiffer's type).

Haiti: Salinas, Cerro de Sal, in the Republic of S. Domingo (A. Sallé).

Cyl. flammulata Pfr., P. Z. S., 1852, p. 141, pl. 13, f. 8.—Monogr., iii, p. 566; Novit. Conch., p. 138, pl. 97, f. 28, 29 ?—Sowerby, Conch. Icon., xx, pl. 2, f. 8.—Crosse, J. de C., 1891, p. 142, pl. 3, f. 1.—*C. planulata* Pfr., Albers, Die Hel., 1860, p. 36 (typographical error).

Allied to *U. malleata,* but nearly smooth, with more varied coloring, more twisted axis, and adnate peristome. The ac-

cessory lamella in both species is quite short, and so completely united with the base of the axis that it appears only as a dilation of the latter.

There are more or less distinct traces of punctures and striation on the last whorl, in *U. flammulata,* and the suture usually shows a faint and spaced crenation above.

29. U. MENKEANA (Pfeiffer). Pl. 38, figs. 12, 13, 14, 15.

Shell oblong, rather obese, thin, the upper third or fourth tapering rapidly to a narrow concave truncation, closed by a tongue-shaped plug, often concealed. Surface glossy, white, variegated with corneous-brown streaks; under the lens seen to be closely and finely striated. Whorls 7½ to 10, slightly convex, the suture regularly and closely crenate on the cone, obsoletely so on the later whorls. Last whorl a trifle free in front, having a cord-like keel below. Aperture large, white inside, rounded; peristome expanded and reflexed, continuous and free, or shortly adherent. Axis nearly straight, a little twisted, especially above, having a slight prominence in the middle in the last whorl.

Length 32, diam. 11.5 mm.

Length 31, diam. 12 mm. (Pfeiffer's type).

Length 30, diam. 10.5 mm.

Haiti: Neyba, in the Republic of S. Domingo (Sallé).

Cyl. menkeana PFR., P. Z. S., 1852, p. 140, pl. 13, f. 7; Monogr., iii, p. 564; Conchyl. Cab., p. 4, pl. 1, f. 7, 8.—CROSSE, Journ. de Conch., 1891, p. 139.

Larger, thinner and more obese than any of the related forms, the diameter more than one-third the length. The "accessory lamella" is completely united with the columella, forming merely a slight prominence thereon. Pfeiffer states that a perfect specimen has 14 whorls (pl. 38, figs. 14, 15). It is usually decollate, as in fig. 13. The peristome may be either adherent above (as in fig. 12) or very shortly free.

30. U. TRUNCATA (Dillwyn). Pl. 39, figs. 27, 28.

Shell subrimate, truncate, cylindrical, thin (becoming thick and solid with age), whitish, striatulate, glossy; suture cre-

nate; whorls 6, a little convex, the middle ones broadly one-banded with purple-brown; last whorl slightly free, carinate dorsally. Aperture oblique, subcircular, the peristome slightly reflexed. Length 30, diam. 11 mm.; diam. aperture 8 mm. (*Pfr.*).

Haiti: Corail, near Jeremie, a single rolled shell in a water course (Weinland).

Helix decollata et fasciata CHEMNITZ, Conchyl. Cab., ix, p. 187, pl. 186, f. 1256, 1257 (1786).—*Helix fasciata* FER., Prodr., p. 61, no. 503 (1822?).—*Cyclostoma fasciata* LAM., An. s. Vert., vi, pt. 2, p. 146 (April, 1822); edit. Desh., viii, p. 358.—DESH., Encyl. Méth., ii, p. 42.—*Cyclostoma ? fasciatum* SOWB., Thesaurus Conchyl., i, p. 108, pl. 24, f. 65 (1843).—*Siphonostoma fasciata* SWAINS, Malacol., p. 333.—*Cylindrella fasciata* PFR., in Phil., Abbild., ii, p. 48, pl. 2, f. 7; Conchyl. Cab., p. 3, pl. 1, f. 5, 6; Monogr., ii, p. 369; iii, 565; iv, 692; vi, 360; Malak. Bl., ix, p. 199 (occurrence at Corail).—CROSSE, Journ. de Conchyl., 1891, p. 134.—*Helix truncata* DILLWYN, Descriptive Catal. of Recent Shells, ii, p. 948 (1817); Wood Index, Testac., pl. 34, f. 136.—*Pupa truncata* GRAY, Ann. of Philos. (n. s.), ix, p. 413.—*Cerion decapitatum* BOLTEN, Mus. Bolt., p. 90, no. 1172 (1798); second edit., p. 64.

This seems to be the first Haitian species of the family noticed by any writer on natural history. Chemnitz gave a good description in 1786, and Favanne, six years earlier, illustrated it. The shell was known to them to be from "S. Domingue;" but for nearly a century later it was not rediscovered, and is now excessively rare. The locality is apparently the mountains of the southwestern peninsula of Haiti, the single specimen found by Weinland having probably been washed down in a stream.

31. U. SERICEA (Pfeiffer). Pl. 41, figs. 60, 61.

Shell deeply rimate, subcylindrical, truncate, rather solid, very finely striatulate, silky, diaphanous, hyaline-whitish, brownish above, the suture marked with a white thread. Whorls remaining 9, narrow, subequal, a trifle convex, the

last not protracted, provided with a cord-like keel at the base. Aperture suboblique, nearly circular, channelled at the base; peristome white, expanded, a little reflexed, adherent above. Length 26, diam. 8⅔ mm.; aperture with perist. 6½ mm. long, 7 wide (*Pfr.*).

Haiti: Port Gonaives (Rolle, Kissling).

Cyl. sericea Pfr., P. Z. S., 1849, p. 134; Monogr., iii, p. 565. —Crosse, Journ. de Conch., 1891, p. 143, pl. 3, f. 2.—*C. s.* var. *kisslingiana* Weinland, Jahrb. d. D. Malak. Ges., vii, 1880, p. 359, pl. 12, f. 15; var. *major* Weinl. l. c.—*Cyl. eugenii* Dohrn, Malak. Bl., vi, 1859, p. 205.—Pfr., Monogr., vi, p. 361.—Crosse, J. de C., 1891, p. 144, pl. 3, f. 3.

The original description is given above. The figures are from Crosse, and represent specimens from Gonaives, collected by Rolle.

The species is evidently variable, and doubtless a number of local races exist, several of which have been named.

Specimens collected by Rolle in 1888 (pl. 39, figs. 32, 33) are milky-white (showing the dried soft parts through blue or blue-black), very glossy and almost smooth in the median whorls, distinctly striate on the cone and the last half of the last whorl. The plug at the summit is tongue-shaped. The axis is moderately twisted throughout, and the short accessory lamella is distinct. There is no brown tint above. The peristome is interrupted above.

Length 23, diam. 7½ mm.; whorls 8½.

Length 20.7, diam. 8 mm.; whorls 7½.

I have figured the teeth of one of this lot, pl. 50, figs. 9, 10.

Var. *laferrierensis* nov. Numerous shells in coll. J. B. Henderson (pl. 41, figs. 62, 63), collected by him at La Ferrière, are more slender, corneous with a brownish tint, which is often stronger on the upper half; sculpture of low arcuate riblets, very much better developed than in Rolle's shells. The axis also is less twisted, and the accessory lamella less developed. The peristome is almost continuous or even slightly free above. The apical plug is very short and convex, but as in the preceding form, the whorl does not break off down to the plug, which is therefore concealed. The whorls are moderately convex.

Length 22, diam. 6.7 mm.; whorls 8.

Length 23.5, diam. 6.7 mm.; whorls 9.

Length 25, diam. 7 mm.; whorls 9.

This is a narrower shell than *sericea* or *eugenii,* and with the peristome less adherent above. The short plug is also probably characteristic, but this has not been described in the types of *sericea, eugenii* or *kisslingiana.*

Var. *eugenii* (Dohrn). Pl. 39, figs. 34, 35, after Crosse. Shell deeply rimate, subcylindrical, tapering above, truncate; livid hyaline, thin, obliquely striate, the suture submarginate. Whorls remaining 8, nearly flat, the last rounded, anteriorly angular on the back, compressed-carinate in the middle, roughly striate on the base and behind the peristome. Aperture subvertical, subcircular; peristome white, expanded and a little reflexed throughout, shortly adherent in front. Length 25, diam. 8 mm.; apert. with peristome 6 mm. long and wide (*Dohrn*). Northwestern Haiti (Dr. Eugene Vesco).

Var. *kisslingiana* Weinland (pl. 41, fig. 64). Shell rimate, oblong-cylindrical, truncate, smooth, very finely striatulate, more distinctly so above and below, glossy, diaphanous whitish, roseate above, the suture indistinct, white-margined. Whorls remaining 8½ to 9½, nearly flat, three or four median ones equal, the last one narrower, appressed, base with a cord-like keel. Aperture nearly vertical, subcircular, obsoletely channelled in the base; peristome a little expanded, thickened, reflexed, resting upon the penult. whorl, sometimes interrupted there. Internal column simply twisted, without lamellæ. Length 29-30, diam. above the middle 9-9½., apert. with perist. 7 mm. (*Weinl.*).

Gonaives, Haiti (Kissling).

Var. *major* Weinl. Whorls 10½; length 37, diam. above middle 10 mm. (*Weinl.*). A single specimen found with var. *kisslingiana.*

32. U. GRUNERI (Dunker). Pl. 39, figs. 16, 17, 18, 19.

Shell oblong, widest at the penult. whorl, the last three whorls wide, those above rapidly tapering to the narrow concave truncation; solid and strong except near the aperture,

the lip being fragile; whitish above, the last whorl bluish, several preceding whorls often livid reddish. Surface glossy, closely striate, the striæ smooth, subvertical and somewhat wider than the intervals, much coarser and arcuate on the last whorl. Whorls 7, but slightly convex, the last having a low, cord-like keel in the middle of the base; shortly free or not so in front. Aperture transversely oval, dark brown inside; peristome broadly expanded and reflexed, white, continuous and free, or adnate above to the preceding whorl. Internal column slightly twisted spirally, perceptibly dilated in the last whorl.

Length 28, diam. 11, diam. aperture 8-9 mm. (Pfr., type).

Length 28, diam. 11 mm.; whorls 6½. Gonave I.

Length 25.5, diam. 10 mm.; whorls 7½. Gonave I.

Length 30, diam. 11 mm.; whorls 7⅓. St. Mark.

Length 27, diam. 11 mm.; whorls 7. St. Mark.

Length 28, diam. 10 mm.; whorls 7. St. Mark.

Haiti: Port au Prince (Dkr.); St. Mark (Henderson & Simpson); Gonave Island (J. J. Brown, Weinland).

Cyl. gruneri Dunker, in Philippi, Abbild., i, p. 185, pl. 1, f. 20 (December, 1844).—Pfr., Monogr., ii, p. 370; Conchyl. Cab., p. 5, pl. 1, f. 11, 12.—Weinland, Jahrb. d. D. Malak. Ges., vii, 1880, p. 362.—Crosse, Journ. de Conch., 1891, p. 135.

The livid blue color and strong striation of the last whorl are characteristic. Dunker's type (pl. 39, figs. 18, 19) had the aperture nearly circular, but in the specimens I have seen it is wider than high, the upper margin being more or less straightened. In the shells seen from Gonave Island the peristome is free throughout. In four shells in a series of ten from St. Mark, J. B. Henderson coll., it is adnate for a short distance above.

U. gruneri is more swollen than *guigouana* (which is rather cylindric); the last whorl tapers more, and is livid or bluish between white striæ, while *guigouana* is dull reddish throughout, or paler at the last whorl. *U. gruneri* is a glossy shell, with the striation becoming coarser on the last whorl, while *guigouana* is lustreless, with little or no change in the striation.

33. U. GUIGOUANA (Petit). Pl. 39, figs. 20, 21.

Shell oblong-fusiform, a little swollen in the middle, rather solid, the spire tapering, apex decollate. Whorls 10 to 13, finely and regularly rib-striate, the upper whitish-rose, the lower somewhat brownish; last whorl provided with an obtuse keel at the base. Aperture subcircular, the peristome white, expanded, a little reflexed. Length 30, diam. 11 mm. (Petit).

Haiti: S. Domingo (Dr. Guigou); Gonave Island, in the mountains near the coast, on the east side (Dr. J. J. Brown, types of *C. mabuja*); Jeremie and Miragoane (Rolle, types of *C. strohmi.*

Cyl. guigouana PETIT de la SAUSSAYE, Journ. de Conchyl., vii, 1859, p. 285, pl. 10, f. 5.—PFR., Monogr., vi, p. 359.—CROSSE, J. de C., 1891, p. 136, pl. 1, f. 3.—*C. gouigouana* MART., in Alb., Die Hel., p. 37.—*Cyl. mabuja* WEINLAND, Jahrb. d. m. Ges., vii, 1880, p. 362, pl. 12, f. 16.—*Cyl. strohmi* MALTZAN, Nachr'bl. d. m. Ges., xx, 1888, p. 177.—CROSSE, J. de C., 1891, p. 136, pl. 1, f. 4.

The type is in the collection of the Journal de Conchyliologie. The striæ are represented much too faintly in my figures 20 and 21, which were copied from the figures of the type specimen. The original description is given above.

Crosse, who figured an original specimen, has already remarked that *C. strohmi* (pl. 39, figs. 22, 23) differs from the type of *guigouana* only in having the peristome carried forward free of the preceding whorl, while in *guigouana* it is adherent above. In this respect *strohmi* is like *mabuja* (pl. 39, figs. 24, 25, 26), of which eight specimens of the original lot are before me. Perhaps *mabuja* can be retained as a variety, characterized by the free peristome; *strohmi* becoming a synonym of it; but in the related *U. gruneri* this character is merely an individual variation.

In Gonave Island specimens the last 3 whorls are of about equal diameter, or the antepenult. may be slightly wider; above this the shell tapers rapidly to the small concave truncation. The sculpture is a close, even, arcuate, rib-striation, not coarser on the last whorl. The surface is dull or but slightly glossy, dull light red-brown or pinkish-purple, and

either uniform or marked into squarish blocks by brown streaks at intervals. The last whorl has a cord-like basal keel. The axis is slightly twisted, as in *U. gruneri,* at its root encircled by and passing into a short accessory lamella. Specimens measure:

Length 26.5, diam. 9.6 mm.; whorls 7½.

Length 24.6, diam. 9.3 mm.; whorls 7.

Length 25, diam. 8.8 mm.; whorls 8.

The *C. strohmi* of Maltzan and its "var." *acupicta* are similarly colored, and measure:

Length 32, diam. 10 mm.; whorls 8-9 (*strohmi*).

Length 18-20, diam. 7 mm. (var. *acupicta*).

34. U. ARCUATA (Weinland & Martens). Pl. 39. figs. 29, 30, 31; pl. 40, figs. 36, 37, 38.

Shell oblong-cylindric, the last whorl tapering, next earlier 4 whorls of about equal diameter, or the third or fourth from the last may be slightly wider, those above tapering rapidly. Surface nearly lustreless, flesh-colored, sculptured with white, very *strongly arcuate riblets,* which are much stronger and often joined in pairs near the sutures, occasionally split or discontinuous in the middle of the whorl, and are often more or less obsolete below the basal keel. The summit is narrowly and concavely truncate. Whorls 7 to 8, somewhat convex, the suture impressed; last whorl typically shortly free in front, having a strong basal keel, crenulated by the striæ. Aperture transversely oval, the peristome broadly expanding, reflexed. Internal column slightly twisted.

Length 20.5, diam. 7 mm.; whorls 7½.

Length 22, diam. 8 mm. (W. & M. type).

Length 23, diam. 7.3 mm.; whorls 8.

Haiti: Neighborhood of Jeremie (Dr. Weinland, J. B. Henderson).

Cyl. arcuata W. & M., v. MARTENS, Malak. Blätt., vi, 1859, p. 53.—PFR., Monogr., vi, p. 360; Novit. Conch., p. 257, pl. 65, f. 1, 2.—SOWERBY, Conch. Icon., pl. 6, f. 49.—CROSSE, J. de C., 1891, p. 137, pl. 1, f. 8, 8 a.

The typical form from Jeremie is nearly cylindrical, as in

pl. 40, fig. 38, and pl. 39, figs. 29, 30. A shorter form, more bulging above, and with somewhat stronger sculpture (pl. 40, figs. 36, 37), has been figured by Pfeiffer and Sowerby, and is represented in the collection of the Academy. Its locality is unknown. In this form the peristome is sometimes adnate to the preceding whorl above. Specimens measure:

Length 19.5, diam. 7.6 mm.; whorls 7½.

Length 19, diam. 8 mm.; whorls 6½.

U. arcuata is much smaller than *U. guigouana,* with more arcuate and irregular riblets.

35. U. TUMIDULA (Weinl. & Mart.). Pl. 41, figs. 71, 72.

Shell closed-rimate, ovate-oblong, terminating above in a short, concave cone, generally truncate; diaphanous, reddish-brown, glossy, reticulated with close arcuate striæ and shallow spiral liræ; suture simple, slightly impressed; whorls of an entire shell about 15, of a truncate shell 8, rather flat, the last with a thread-like keel roughened by the striæ passing over it; shortly produced. Aperture subcircular, transversely dilated, the peristome expanded throughout, flexuous, white, continuous. Length of an entire shell about 19, of a truncate one 15; diam. above the middle 5 mm.; aperture with perist. 4 mm. (*v. Mart.*).

Haiti: Neighborhood of Jeremie (Weinland).

Cyl. tumidula W. & M., MARTENS, Malak. Bl., vi, 1859, p. 54.—PFR., Novit. Conch., p. 261, pl. 65, f. 16, 17; Monogr., vi, p. 370.—*C. fumidula* Weinl., ALBERS, Die Hel., 1860, p. 37.

Somewhat doubtfully referred to this subgenus. It is known to me by the above description only.

36. U. INNATA (Weinland). Pl. 41, figs. 65, 66.

Shell closed-rimate, ovate-oblong, solid, brownish flesh-colored; closely thread-costate, the riblets wavy; spire truncate, the apex a little acute, suture simple. Whorls of a truncate shell 8 to 9, a little convex, the last whorl adnate in front, very little free, compressed, with a high crest, the crest and base within it whitish. Aperture oblique, nearly circular; peristome continuous, white, narrowly expanded, little thick-

ened, resting upon the preceding whorl. Length 15-16, diam. 4-5 mm.; apert. with perist. 4 mm. (*Weinl.*).

Haiti: Jeremie (Weinland).

Cyl. innata WEINL., Malak. Bl., xxiii, 1876, p. 170, pl. 2, f. 1, 2.—PFR., Monogr., viii, p. 621.

"In general appearance it is nearly related to *C. tumidula* W. & M., but differs by the adnate last whorl and peristome, besides the opacity of the more solid, lustreless shell, and the much stronger, less numerous, white, irregular ribs, which recall the large *C. arcuata.*"

Subgenus ARANGIA Pilsbry & Vanatta, 1898.

P. & V., Proc. A. N. S. Phila. 1898, pp. 270, 275. Type *U. sowerbyana* (Pfr.).

Urocoptis with a single strong, *smooth* spiral lamella revolving about the axis, median in each whorl, sometimes obscurely double in some lower whorls. Last whorl *carinate below,* shortly or not free in front. (Named for Rafael Arango y Molina.)

Eastern Cuba and Gonave Island, Haiti. This group of but two species is probably related to *Idiostemma,* but the dentition is still unknown. *U. monticola,* the Haitian species, may prove, when the dentition is examined, to belong near *Amphicosmia.* The shape of the base is unusual in *Urocoptis.*

37. U. SOWERBYANA (Pfeiffer). Pl. 44, figs. 22, 23, 24.

Shell cylindric-tapering, narrowly truncate, rather solid, pale brown, usually with some inconspicuous whitish streaks. Surface lustreless, sculptured with fine, nearly straight or subarcuate riblets, narrower than their intervals, and often a little stronger near the sutures. Whorls 15-16, narrow, convex, the last very shortly or not free in front, carinate at the periphery, *which forms nearly a right angle,* the base being flattened, only slightly convex. Aperture *transversely oval* or subcircular; peristome thin, expanded throughout, usually free, but sometimes shortly adnate above. Axis bearing a very strong median ascending lamella, acute above, round-edged below, and subobsolete in the last whorl.

Length 35, diam. 8 mm. (Pfeiffer's type).

Length 35.5, diam. 7 mm., whorls 16.

Length 32, diam. 6.3 mm., whorls 14½.

Eastern Cuba: Various localities in Guantánamo district, the typical form at Monte Libano (Gundlach).

Cyl. sowerbyana Pfr., P. Z. S., 1846, p. 116; Phil., Abbild., ii, p. 217, pl. 1 (*Achat. et Cyl.*), f. 13 (April, 1847); iii, p. 18, pl. 3, f. 12; Monogr., ii, p. 372; iii, 568; iv, 697; vi, 366; viii, 431; Conchyl. Cab., p. 15, pl. 2, f. 24, 25; Malak. Bl., vi, 1859, p. 95.—Sowerby, Conch. Icon., xx, pl. 3, f. 20.—Arango, Contrib., p. 108.—Crosse, Journ. de Conchyl., 1890, p. 219.—*Urocoptis* (*Arangia*) *sowerbiana* Pils. & Van., Proc. A. N. S. P. 1898, p. 275, pl. 18, f. 20.

This species is quite variable in size and number of whorls as well as in the shape of the aperture. The single strong, *smooth* plait of the axis is characteristic. A variety found by Gundlach at the plantation "Romanie," Monte Toro, is smaller, with 11-12 whorls, length 22, diam 7½ mm. (fig. 24).

Var. *montetoronis* n. v. Pl. 44, fig. 30.

Small, rapidly tapering, the basal keel weak or subobsolete. Whorls about 9½. Length 17½, diam. 5 mm. This form occurs at various plantations at Monte Toro. A specimen with entire spire, received by Pfeiffer, has 18 whorls, and measures 18 mm. long, 4¼ wide.

38. U. monticola (Weinland). Pl. 44, figs. 25, 26, 27.

Shell subcylindric, usually widest above the middle, or the lower two-thirds may be of equal diameter, tapering to a rather wide truncation above; thin; pale brownish; surface lustreless, sculptured with widely-spaced, rather strong, arcuate thread-like riblets, which are usually a little enlarged, as though a drop had run down, at suture below and on the basal keel, below which striæ replace them. Whorls 13-14, narrow and somewhat convex, the last not free in front, strongly carinate below, concave on each side of the keel. Aperture obliquely short ovate; peristome rather narrowly reflexed, shortly adnate above. Axis having a single strong spiral

lamella, above which there is a spiral callous cord, partially united with the main lamella, in the last four whorls.

Length 16.5, diam. 4.3 mm.; whorls 14 (Weinl., type).

Length 17.5, diam. 4 mm.; whorls 14.

Length 15.5, diam. 3.8 mm.; whorls 13.

Haiti: Gonave Island, in the mountains (Dr. J. J. Brown).

Cyl. monticola Weinl., Jahrb. d. D. Malak. Ges., vii, 1880, p. 363, pl. 12, f. 17.

Not closely related to any known species. The strong, spaced riblets, adnate peristome, and the obtuse spiral lamella, reinforced in the last several whorls by a callous cord above, are its chief peculiarities. Figs. 26, 27 were drawn from specimens of the original lot, received from Dr. Brown.

Subgenus Idiostemma Pils. & Van., 1898.

P. & V., Proc. Acad. Nat. Sci. Phila. 1898, pp. 270, 274 (July 12, 1898). Type *C. uncata* Gundl.

Urocoptis with the axis armed with pairs of hooks or flat nodes, or girt by a wide callous band or double cord bearing oblique nodes or riblets. (*Idiostemma,* peculiar wreath, i. e., about the axis.)

Distribution, eastern Cuba. One of the most peculiar and highly evolved groups of the genus, some of the species having the axial armature wonderfully specialized. The radula is also somewhat specialized by reduction of the number of teeth. *Vide* p. 110. The earliest whorls are smooth in *U. perlata,* delicately costellate in *U. lateralis.* In other species they are unknown.

The sculpture in the more highly evolved forms consists of hollow ribs, the acme of sculpture-evolution in the *Urocoptidæ.* It is noticeable that some species have entered upon the senile stage, this sculpture becoming more or less decadent upon the last whorl or two, the ribs interrupted, irregular, and reduced. Like many other phyla in this family, *Idiostemma* is an intensely specialized group, manifested in wonderful and *outre* forms, but already showing signs of old age.

There are two series of species; the group of *uncata,* in which axial hooks are developed, and that of *U. geminata,* in

which a callous band or double cord bears oblique nodes or riblets. The external ornamentation and the general shape are wonderfully varied, and in former artificial classifications the species have been widely scattered. They are illustrated on plates 44, 45, and the upper part of pl. 46.

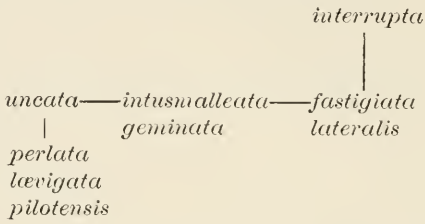
Key to Species of Idiostemma.

I. Axis armed with pairs of hooks, at least above.
  1. Hooks swollen; shell strongly ribbed. *U. uncata*, no. 39.
  2. Hooks compressed; shell smooth, with subsutural beads. *U. perlata*, no. 40.
  3. Hooks above only ; shell smooth throughout.
    a. Diam. about 4.5 mm., whorls about 12; flat axial nodes in the median whorls. *U. laevigata*, no. 41.
    b. Diam. about 3 mm., whorls about 14; axis with 2 thick lamellæ below. *U. pilotensis*, no. 42.

II. Axis thickened by a callous, obliquely ribbed band, or a double spiral cord bearing oblique nodes.
  1. Shell ribbed.
    a. Axis encircled by a stout double cord, the sulcus between obliquely ribbed (pl. 45, fig. 53) ; shell irregularly ribbed below. *U. geminata*, no. 43.
    b. Axis bearing compressed, sigmoid, wide-spaced ribs, with concave intervals (pl. 45, fig. 47) ; exterior with regular, rather narrow ribs. *U. intusmalleata*, no. 44.
    c. Axis bearing a spiral callous band, thickened above and below in each whorl, and obliquely ribbed (pl. 45, fig. 41). *U. fastigiata*, no. 45.
  2. Shell ribless, sometimes with sutural and basal nodules; very long and tapering. *U. lateralis*, no. 46.

The smooth forms, *lævigata, pilotensis, perlata* and *lateralis,* are in all probability descendants of ribbed species. All the

rest, *uncata, intusmalleata, geminata, fastigiata* and *interrupta*, have the same type of external sculpture, but they have diverged widely in the sculpture of the axis. The relationships of the species may be approximately represented by a diagram:



39. U. UNCATA ('Gundlach' Pfr.). Pl. 44, figs. 31, 32, 33.

Shell cylindric, slightly tapering above to a rather wide truncation (or sometimes retaining a long, attenuated juvenile stage), rather thin, whitish. Surface lustreless, roughly sculptured with *coarse ribs, which are swollen above and below near the suture,* and are continuous from whorl to whorl; these ribs are wider, more inflated on the upper than on later whorls, and are *hollow,* usually in part broken; the intervals very finely, irregularly striate. Whorls about 15 in normally decollate shells, hardly convex, the last free in front, excavated below the periphery, striate beneath, the neck tumid at the periphery. Aperture transversely obliquely ovate. Peristome narrowly reflexed. Axis rather stout in the cylindrical portion, each whorl having *two opposite pairs of swollen hooks*, one hook of each pair above, the other below, partially adnate to the partitions. In the tapering whorls the axis is slender and simple, and hooks are wanting in the later 1½ whorls (fig. 33).

Length 19, diam. 4 mm.; whorls 15.

Length 17, diam. 3.8 mm.; whorls 13½.

Length 22½, diam. 4 mm.; whorls 22½.

Eastern Cuba: Yateras and Monte Libano, jurisdiction of Guantanamo, under stones (Gundlach); Farallones, in southern part of prov. Santiago (Chas. Wright).

Cyl. uncata GUNDL., PFR., Malak. Bl., vi, 1859, p. 97; Novit.

Conch., p. 247, pl. 63, f. 10-12; Monogr., vi, p. 382.—Sowerby, Conch. Icon., xx, pl. 16, f. 144.—Arango, Contr., p. 122.—Crosse, J. de C., 1890, p. 235.—*Urocoptis (Idiostemma) uncata* (Gundl.), Pils & Van., Proc. A. N. S. Phila. 1898, p. 275, pl. 17, f. 10 (axis).

Resembles *U. fastigiata* and *U. geminata* in the strong ribs, but differs conspicuously in the peculiarly modified axial armature. The first two whorls are delicately ribbed, as in *U. lateralis.*

40. U. perlata ('Gundl.,' Pfr.). Pl. 45, figs. 48, 49, 50, 51, 52.

Shell cylindric-fusiform, the upper half tapering to a rather wide truncation, thin, corneous, somewhat transparent. Surface *glossy, smooth except for a series of small white nodes, strung rosary-like below the suture;* and the *base and last third of the last whorl is sculptured with thread-like striæ.* Whorls slightly convex, the last shortly free in front, rounded below. Aperture obliquely round-oval, the peristome white, narrowly reflexed. Internal column armed in the intermediate whorls with compressed hooks placed in obliquely vertical pairs, curving towards each other, about 4 pairs in a whorl (fig. 52).

Length 12.5, diam. 3.2 mm.; whorls 9½-11.

Eastern Cuba: Yateras, district of Guantanamo, prov. Santiago, on stones (Gundlach); sugar-plantation "El Coco," Sagua de Tanamo (Arango).

Cyl. perlata Gundl. mss., Pfr., Malak. Bl. vi, 1859, p. 97; Novit. Conch., p. 459, pl. 100, f. 25-28; Monogr., vi, p. 362.—Arango, Contrib., p. 106.—Sowb., C. Icon., xx, pl. 10, f. 88.—Crosse & Fischer, J. de C., 1870, p. 12.—Crosse, J. de C., 1890, p. 216.

In internal structure this species is intermediate between *U. uncata* and *U. lævigata;* and the external sculpture shows the same relationship, the subsutural beads being vestigial ribs, which in *lævigata* have wholly disappeared.

The fact that in *U. lævigata,* pairs of hooks *precede* the nodes on the pillar, indicates that the hook structure is the

earlier one, their solidification into plate-like nodes in later whorls of this species being secondary, and brought about by the deposition of shell-stuff between the hooks. The nepionic whorls are smooth.

41. U. LÆVIGATA ('Gundl.' Pfr.). Pl. 44, figs. 28, 29, 34, 35.

Shell cylindric-fusiform, the upper third or half tapering to a rather wide truncation; thin; light brown or corneous, somewhat transparent when fresh; surface *glossy, smooth* except for slight growth striæ, the base and last half of the last whorl striate. Whorls nearly flat, the last having a cord-like keel below, *very shortly* free in front. Aperture oblique, round-oval, the peristome white, narrowly expanded, the left margin somewhat reflexed. Internal pillar slender, smooth and somewhat sinuous, having a spiral convexity in the last two whorls, the next earlier three whorls having short oblique nodes upon the median convexity, about 5 on a whorl, separated by concave intervals, and concave on their two faces. In earlier whorls each of the nodes becomes interrupted in the middle, and is transformed into a pair of somewhat hook-like processes, curving toward one another; and in the early whorls the axis becomes smooth and somewhat sinuous again.

Length 17.5, diam. 4.6 mm.; whorls 12½.

Length 15.6, diam. 4.5 mm.; whorls 12.

Eastern Cuba: Prov. Santiago at Monte Toro, in the jurisdiction of Guantanamo, under stones (Gundlach).

Cyl. lævigata Gundl. mss., PFR., Malak. Bl., vi, 1859, p. 96; Novit. Conch., p. 460, pl. 100, f. 29-31 (*C. lacrigata* at foot of plate); Monogr., vi, p. 362.—ARANGO, Fauna, p. 106.—CROSSE, J. de C., 1890, p. 216.

Externally much like *U. lavalleana* Orb., but the last whorl is only very shortly free, not descending, and it is more keeled below. The two species differ widely in internal structure.

42. U. PILOTENSIS ('Gundl.' Arango).

Shell cylindric-turrete, truncate, thin, smooth, glossy, pellucid, corneous; suture not denticulate; whorls remaining 14, a little convex, the last shortly free, descending, striate,

lightly [læviter] thread-carinate above the base. Aperture oblique, subcircular, the continuous peristome narrowly expanded throughout.

Length 12-16, diam. 3 mm. Internal column having hooks in the early whorls, in the last bilamellate, the lamellæ thick (*Arango*).

Eastern Cuba: Piloto-arriba, district of Mayari, prov. Santiago (Jeanneret).

Cylindrella lavalleana Orb. var.?, Pfr., Malak. Bl., ix, 1862, p. 131, no. 52.—*Cyl. pilotensis* Gundl. mss., Arango, An. Real. Acad. Cien. etc. de Habana, xii, p. 283, no. 12 (1876); Contrib. p. 106.

"Differs from *Cyl. lavalleana* Orb. by the more cylindric shape, the shell being smooth except the last whorl, and the suture not denticulate; it is smaller, and the internal column is bilamellate and hooked." (Arango). In the *Contribucion* Arango states that there are two heavy laminæ in the first whorls, and hooks like those of *uncata* in the last. This reverses the statement in his original description.

Pfeiffer remarks that it is very near *C. elegans,* but with a short thread-like keel on the base of the last whorl, and entirely smooth. I have not seen the species.

43. U. geminata (Pfeiffer). Pl. 45, figs. 42, 43, 53.

"Shell rimate, cylindrical, rather widely truncate, solid, gray-whitish, closely subarcuate-striate and having compressed ribs, swollen into nodules above and below, close on the upper whorls, rare or almost disappearing below the middle. Whorls remaining 13 to 14, rather flattened, the last striate and ribbed, somewhat bicarinate beneath, a furrow between the carinæ; anteriorly moderately free. Internal column encircled by a thick, deeply grooved lamella which is somewhat beaded. Aperture oblique, obliquely piriform, subangular at the base on the right side; peristome continuous, narrowly expanded. Length 17, diam. 4 mm.; aperture 3⅓ mm. in oblique length, 2⅔ wide." (*Pfr*).

Eastern Cuba: Cayo del Rey, in the jurisdiction of Mayari, prov. Santiago (Wright).

Cyl. geminata Pfr., Malak. Bl., xvii, 1870, p. 92; Monogr., viii, p. 441.—Arango, Fauna, p. 122.

This species varies widely in sculpture. The whole surface has fine, sharp, slightly waved striæ. On the upper half there are rather close stout hollow ribs, swollen at the sutures, and often more or less extensively lost by erosion. At and below the middle these ribs become sparser, or they become weaker midway between sutures, leaving a series of oblong bosses above and below the sutures. The last one to three whorls may be either almost ribless, or there may be irregularly developed ribs, as in the specimen figured (fig. 42). The last whorl is either rounded beneath, or flattened, or even with a spiral concavity, which Pfeiffer refers to in his description.

The axis is very wide in the median whorls. It is encircled by a double cord with a median sulcus, and sculptured with oblique nodes, as shown in fig. 53, which represents the 5th, 6th and 7th whorls from the base. It diminishes rapidly above, slowly below, and within the last whorl is simple, with merely a slight swelling. The shell ordinarily measures, length 15, diam. 3.8 mm., and has about 11 whorls.

44. U. intusmalleata (' Gundl.' Pfr.) Pl. 45, figs. 44, 45, 46, 47.

Shell cylindric, the upper third or fourth tapering to a rather wide truncation; thin; gray-white; dull, sculptured with narrow ribs, about one-third as wide as their intervals, swollen drop-like at the ends; each interval sculptured with about 4 (3 to 6) sharp thread-like striæ. Whorls rather flat, the suture impressed; last whorl shortly free in front, somesomewhat flattened basally, subangular at the periphery. Aperture obliquely short-ovate, the peristome expanded and narrowly reflexed. Internal pillar moderately stout in the intermediate whorls, constricted above and below near the partitions, sculptured with wide-spaced, sigmoid, oblique ribs connecting low spiral ridges running above and below in each whorl (pl. 45, fig. 47, fourth whorl from base). In the last two whorls this sculpture is obsolete, and above the pillar rapidly tapers, becoming smooth (pl. 45, fig. 46, the 7th, 8th and 9th whorls from the base).

Length 13.5, diam. 3 mm.; whorls 12.

Length 16, diam. 3.3 mm.; whorls 13.

Eastern Cuba: near Santiago, in the districts Enramada and Corralillo, under stones; also Monte Toro, west of Yateras, somewhat larger specimens (Gundlach); plantation El Coco, in Sagua de Tanamo (Arango); in the north reported from Mayari, Barajagua and Cayo del Rey (Wright).

Cyl. intusmalleata Gundlach, Pfr., Malak. Bl. v, 1855, p. 186; vi, 1859, p. 97; ix, p. 131.—Pfr., Monogr., iv, p. 705.—Sowerby, C. Icon. xx, pl. 7, f. 64.—Poey, Memorias ii, p. 93.—Arango, Fauna, p. 122.—Crosse, J. de C., 1890, p. 235.—*Cyl.* (*Scalatella*) *intermalleata* Schaufus in Paetel. Catal., p. 68.

The ribs are narrower and closer together than in *U. fastigiata*, which is moreover a longer shell. *U. uncata* has the ribs more swollen on the upper part of the shell; and it differs from both in the internal structure. *U. geminata* is the most closely allied species, but in that the ribs are less slender and less regular, the intervals are more finely striate, and the internal column, while of the same type, differs conspicuously in detail of structure. *U. interrupta* is an externally very similar species. Gundlach notes that about 10 whorls are lost by the adult.

This species ranges across the island from north to south.

45. U. fastigiata ('Gundl.' Pfr.). Pl. 45, figs. 36-41.

Shell subulate, gray-white, usually truncate but sometimes retaining the dead-white early portion. Deciduous whorls finely striate, the later of them and the earlier permanent whorls having nodules above and below the sutures; on the greater part of the shell these become ribs, which may be either narrow, and weaker in the middle, or very stout and continuous; and though more or less extensively hollow, they are but rarely broken. On the last whorl the ribs are usually interrupted and dislocated. Suture deep, the ribs more or less continuous across it. Base flattened, somewhat concave below the peripheral angle. Last whorl free in front. Aperture obliquely ovate, narrowed at the outer basal angle. Peristome thin, expanded, subreflexed. Internal column rather

stout, being thickened by a wide spiral band which leaves a groove above and below in each whorl, is somewhat concave in the middle, and is obliquely, weakly costate (fig. 41). In the tapering upper portion it is smooth and somewhat sinuous.

Length 18.5, diam. 3 mm.; whorls 16.

Length 21.3, diam. 2.7 mm.; whorls 23.

Length 31, diam. 3.3.; whorls 36-38 (Pfr.).

Length 14.5, diam. 3.; whorls 12.

Eastern Cuba: Baracoa, Yunque, Mata, on stones (Gundlach).

Cyl. fastigiata Gundlach mss., Pfr., Malak. Bl. vii, 1860, p. 20; Novit. Conch. p. 263, pl. 65; f. 23-25; Monogr., vi, p. 382.—Sowerby, Conch. Icon. xx, pl. 4, f. 34.—Arango, Fauna, p. 121.

The size and number of whorls retained varies within wide limits, and the sculpture, as the figures show, is not less variable. The internal column is of the same general type as that of *U. geminata*, but far less strongly developed, more as in *U. lateralis*, which though conspicuously diverse, is the most closely allied species. *U. fastigiata* has been distributed under the apparently ms. name *C. lincata* Gundl. It is known from the district of Baracoa only.

46. U. lateralis ('Paz' Pfr.). Pl. 46, figs. 54-59.

Shell *very slender, subulate*, light brown or purplish brown, *tapering from the base to the narrow truncation*, or rarely retaining all or part of the abandoned white early whorls. Surface lusterless, very *finely arcuately striatulate*, the median and later whorls more or less distinctly crenate below the suture, the last two or three whorls usually crenate above the suture also, and with a row of small nodes along the basal angle. *Base flat.* Last whorl becoming free, with a *rather long straight descending neck.* Aperture obliquely oval, the peristome expanded and narrowly reflected. Internal column rather slender, thickened by a spiral callus which is obliquely, closely ribbed, a little concave and smoother in the middle, and separated by grooves from the partitions above and below (pl. 46, fig. 56).

Length 17.6, diam. 2.5 mm.; whorls 16. Yunque; normally truncate.

Length 21.5, diam. 2.5 mm.; whorls 19. Yunque; normally truncate.

Length 27, diam. 2.3 mm.; whorls 33. Spire complete.

Eastern Cuba: Yunque de Baracoa, on rocks and stones (Gundlach).

Cyl. lateralis Paz mss., Pfr., Malak. Bl. vii. 1860, p. 21; Novit. Conch. p. 263, pl. 65, f. 26, 27; Monogr., vi, p. 376.—Arango, Contrib., p. 118.

Related to *U. fastigiata,* but very distinct by its ribless surface, tapering shape, many convex whorls and more slender pillar. The typical form (figs. 55, 57, 58) is almost or quite free from sutural and basal nodules, but specimens with these vestiges of ribs (fig. 54) occur with them. Those illustrated are from the "Yunque" of Baracoa, the only locality yet known.

The ribs on the internal pillar give the impression voiced by Arango that the column is sinistrally plicate; but they are of the same nature as the oblique ribs in other species of this group, and further examples of homoplastic structure occur in *Cœlostemma, Cœlocentrum,* etc.

The nepionic whorls are vertically, delicately ribbed (pl. 46, fig. 59).

Section Maceo Pils. & Van., 1898.

Pilsbry & Vanatta, Proc. A. N. S. Phila. 1898, pp. 270, 275. Type and sole species *U. interrupta* Gundl.

Urocoptis with a single stout axial lamella median in each whorl, the rounded edge of which is closely crenulate or "milled" (pl. 46, fig. 61).

The single species is from eastern Cuba. Sectional name to honor a Cuban patriot.

While at first sight the axis is quite unlike that of *Idiostemma,* it is in reality only a modification of the type seen in *U. fastigiata,* produced by the upper edge of the callous band around the axis of that species becoming much more prominent, and the lower edge diminishing. The fine crenu-

lations of the edge of the spiral fold are homologous with the oblique plicæ developed in *Idiostemma*. The external sculpture of the shell is that of the ribbed forms of *Idiostemma*.

47. U. INTERRUPTA (Gundlach). Pl. 46, figs. 60-64.

Shell cylindric, the upper third or half tapering to a rather wide truncation; thin; gray-white; surface lustreless, sculptured with close, rounded hollow ribs above (generally in large part broken in adult shells), the ribs becoming weak in the middle or wholly interrupted on the median whorls, persisting only as white bosses above and below the suture, on the later whorls; the intervals finely striate. Last whorl rounded below, produced in a short, round, somewhat contracted neck. Aperture obliquely oval, the peristome narrowly reflexed. Internal axis wound round with a stout lamella, rounded at the edge and milled like a coin; it is strongest in the median whorls, becoming lower and more oblique above and below, obsolete in the last whorl, where the axis is slender and straight.

Length 12.3, diam. 3 mm.; whorls 10½.

Length 11.5, diam. 3.3 mm.; whorls 10-13 (*Pfr.*).

Length 14, diam. 3.3 mm.; whorls 11.

Length 10.8, diam. 3 mm.; whorls 9½.

Eastern Cuba: Manzanillo (type locality), Santiago de Cuba and Cabo Cruz; larger specimens from Guisa (Gundlach).

Cyl. interrupta Gundlach mss., PFR., Malak. Bl., iv, 1857, p. 175; v, p. 44; Conchyl. Cab., p. 29, pl. 4, f. 7-9; Novit. Conch., p. 248, pl. 63, f. 13-15; Monogr., iv, p. 705; vi, p. 382. —ARANGO, Contrib., p. 121.—SOWB., C. Icon., pl. 8, f. 71.—*Urocoptis* (*Maceo*) *interrupta* Gundl., PILS. & VAN., Proc. A. N. S. Phila. 1898, p. 275, pl. 17, f. 7 (axis).

Near *U. geminata* in sculpture, but distinct from all other known species in the single stout axial lamella, rounded at the edge, which is closely crenulate or "milled" like a coin. This sculpture often extends below the median ridge, especially in some specimens which have the pillar calloused below it, the prominent spiral in *Maceo* being homologous with

the upper of the two cords in *Idiostemma*. There are frequently some irregularly spaced ribs on the last whorl, as in fig. 63.

Subgenus Cochlodinella Pils. & Van., 1898.

Proc. A. N. S. Phila. 1898, pp. 270, 274. Type *U. poeyana*.

Shell similar to *Urocoptis* s. str. in general structure, but small and thin, fusiform or subcylindric, the axis slender and straight, arcuate in the last whorl only. Basal keel rather weak or wanting. Spire truncate (rarely retained entire in exceptional individuals); the rejected whorls numerous, attenuate, apical whorls smooth, bulbous.

Distribution, western Cuba, southern Florida.

The dentition of the species of this group (pl. 61, fig. 19, *U. poeyana*) closely resembles that of the smaller forms of *Gongylostoma* (such as pl. 61, fig. 12, *U. wrighti*). The rhachidian tooth is rather wide, its cusp equal to the ectocones of the adjacent lateral teeth, and the number of teeth in a transverse row is small, 10.1.10 in *U. poeyana*. The general structure of the shell (aside from the axis), the large number of deciduous whorls of the slender spire, and the smooth, somewhat club-shaped earliest whorls, all show close relationship to *Gongylostoma*, and indicate that *Cochlodinella* is a branch of the same stock in which axial lamellæ have either never been developed, or have been wholly lost. I see at present no way of determining whether the axis is primitive or degenerate, but the former alternative is perhaps the simpler. The group is not related to Jamaican species of similar shell-structure, the testimony of the dentition showing the resemblance of the shells to be adventitious.

A group of Cuban species superficially similar to the *U. rosea* group of Jamaica. The species *gonostoma* Gundl. and *paradoxa* Arango, at one time referred to here, constitute the new subgenus *Lyobasis* Pilsbry, in *Opeas*, the former species being the type. This stenogyroid group is peculiar in the detached and free latter half of the last whorl, the piriform aperture and continuous peristome.

Urocoptis floridana (*Cyl. floridana* Dall, Trans. Wagner

Free Inst. Sci. iii, p. 13), from the Oligocene of Ballast Point, Tampa, Florida, belongs apparently to *Cochlodinella*.

Key to Species.

I. Aperture subcircular. Western Cuba.

1. Neck quite short, or adnate. *U. poeyana*, no. 48; *U. presasiana*, no. 49; *U. conferta*, no. 50.
2. Neck moderately long, round.
   - *a*. Corneous or brown; riblets slightly arcuate, the intervals about three times their width. Length 14 to 16, diam. 3.6 to 4 mm. *U. illamellata*, no. 51.
   - *b*. Ribs sinuous, wide-spaced. Length 14 to 16, diam. 3 to 3.5 mm. *U. mixta*, no. 53.
   - *c*. Dark purple-brown; riblets rather close and fine, 17-19 x 4-4.4 mm. *U. atropurpurea*, no. 54.
   - *d*. Pale corneous; striation fine and close, coarser on the rather long neck; length 12.5-14, diam. 3.1-3.5 mm. *U. soluta*, no. 55.

[II. Aperture rounded-ovate, the outer margin angularly produced; striation close, fine; neck flattened above and on the outside. About 10 x 2.5 mm. Eastern Cuba. *Brachypodella angulifera*.]

48. U. POEYANA (Orbigny). Pl. 42, figs. 77, 78, 79.

"Shell much lengthened, fusiform, thin, corneous, longitudinally acutely striate; spire much lengthened, inflated, acuminate behind, truncate (subulate in the young), whorls 11, somewhat convex, the last carinate in front; aperture round, peristome continuous, acute. Length 14, diam. 3 mm." (*Orb.*)

Cuba (M. de la Sagra).

Pupa poeyana ORB., Hist. de l'Ile de Cuba, Moll., i, p. 185, pl. 12, f. 24-26 (1841, *cf.* Mal. Bl., xxii, p. 174, footnote).—*Cylindrella poeyana* Orb., PFR., Monogr., ii, p. 380; iii, 572; iv, 702; vi, 374; Mal. Bl., 1854, p. 211; Conchyl. Cab., p. 26, pl. 3, f. 29-31.—CROSSE, J. de C., 1890, p. 229.—ARANGO, Fauna Mal. Cubana, p. 116.

A typical Cuban specimen is figured (pl. 42, figs. 77, 78, 79.) It is strongly fusiform, the four later whorls rather swollen, those above tapering to a truncation about half the greatest diameter of the shell. The last whorl also tapers rather strongly, has a low, hardly cord-like basal keel, sometimes nearly obsolete, and projects very shortly in front. Whorls ordinarily 9-11. The surface is glossy, corneous, with close, even, slightly sinuous but hardly arcuate whitish thread-like striæ, narrower than their intervals. The aperture is oblique and almost circular, with a reflexed, slightly thickened white lip. The axis is straight and simple. Length 13, diam. 3.2 mm.

Var. VARIEGATA (Pfeiffer). Pl. 42, figs. 80, 81, 82.

"Shell fusiform-cylindric, truncate, rather straightly rib-striate; longitudinally denticulate-streaked with whitish and corneous, the apex reddish or brown. Whorls 12. A little convex, the last a little protracted, carinated at the base. Aperture circular, the peristome expanded, white. Length 17, diam. 4 mm.; diam. of aperture 3¼ mm." (*Pfr.*).

Cuba: Very abundant on palm roots and in woods around Matanzas (*Pfr.;* Bartlett). Carmelo and Marianao, near Havana (S. N. Rhoads). Florida: Key West (Hemphill, Rush *et al.*); near the mouth of Miami River, under stones in open pine land, copiously (Rhoads, Pilsbry).

Clausilia subula? PFR., Wiegm., Archiv f. Naturg., 1839, i, p. 353.—*Cyl. variegata* PFR., Symbolæ, ii, p. 60 (1842); in Phil., Abbild., i, p. 180, pl. 1, f. 11; Monogr., ii, p. 374; iii, 572; iv, 702; vi, 374; viii, 434; Malak. Bl., 1854, p. 211; Conchyl. Cab., p. 25, pl. 3, f. 18-28.—SOWB., Conch. Icon., xx, pl. 15, f. 131.—*Cylindrella poeyana* Orb., BINNEY, Terr. Moll., iv, p. 149; Land and F.-W. Sh. of N. A., p. 22, f. 15; Terr. Moll., v, p. 382, pl. x, f. R (teeth); Man. Amer. Land. Sh., p. 411, f. 451 (teeth); p. 412, f. 452 (shell).—*Urocoptis poeyana* Orb., RHOADS, Nautilus, xiii, p. 45.—PILSBRY, Nautilus, xi, 107.—*Pupa* (*Siphonostoma*) *lactaria* GLD., Bost. Journ. of Nat. Hist., iv, 1844, p. 491, pl. 24, f. 13.—*Cylindrella lactaria* GLD., Terrestr. Moll. U. S., ii, p. 309 (descr. of Matanzas spec.); iii, pl. 69, f. 2 (Floridian specimen).

Cylindrella jejuna Gld., Proc. Bost. Soc. N. H., ii, 1848, p. 41; Terr. Moll. U. S., ii, p. 310; iii, pl. 69, f. 3.

U. p. variegata differ from typical *pocyana* in the less fusiform shape, generally more broadly truncate apex, and especially in the much more distinct basal carina. The white streaks are not a very constant feature. Figure 81 of plate 42 represents a Matanzas specimen. Gould's type of *C. lactaria* (pl. 42, fig. 80) was also from this place. It is a far more common shell in collections than *U. pocyana*. The length of Matanzas shells ordinarily varies from 11 mm. with 9½ whorls to 16 mm with 11 whorls.

At Marianao Mr. Rhoads collected numerous rather large specimens, normally truncate adults measuring length 15 mm. with 10½ whorls to 12 mm. with 9⅓ whorls. 9½ whorls are cut off in adult shells. At Carmelo the shells were smaller, length 11 mm. with 8½, to 8½ mm. with 7¾ whorls.

Floridian specimens from Miami (fig. 82) are either corneous-white or brown, with white striæ and with or without some white maculation. They are usually broadly truncate, with about 8½ whorls remaining, the basal keel rather strong. The peristome is either shortly free or rarely adherent above. In rare cases where the abandoned early whorls have not broken off there are 17 to 19½ whorls, the first one smooth and translucent, very rapidly widening, next several whorls narrower, so that the tip is bulbous. The size varies a good deal.

Length 15.5, diam. 2.8 mm.; whorls 19½ (apex entire).

Length 12.5, diam. 2.8 mm.; whorls 17 (apex entire).

Length 12.5, diam. 3.2 mm.; whorls 9 (truncate).

Length 9.5, diam. 2.8 mm.; whorls 7½ (truncate).

Length 9.5, diam. 2.5 mm.; whorls 8 (truncate).

The white maculation typical of *variegata* is frequently developed; the lip is thin, well expanded and somewhat reflexed.

At Key West, Fla., the shells have a much thickened peristome, and the axis is usually perceptibly twisted.

Var. *jejuna* (Gld.). Pl. 42, figs. 83, 84.

Smaller, the neck longer. Length two-fifths, diam. one-

tenth inch. "Seems to be constantly smaller, darker colored, more solid and with more convex whorls" than *pocyana*. Florida.

Agrees in size with the smaller specimens of *U. pocyana* found at Miami, but none of the several hundred collected there by Mr. Rhoads and myself has so long a neck as the figure of *jejuna* shows.

Var. LACTEOFLUA Pilsbry, n. v. Pl. 42, fig. 85.

Shell corneous below, brownish above, copiously marked with opaque white irregular stripes and spots, rarely wanting. Striæ *wide-spaced, strong below the sutures, elsewhere weak* or obsolete, except on the earlier and last whorls. Basal keel low but distinct. Axis simple. Aperture as in *U. pocyana*.

Length 13.7, diam. 3.2 mm.; whorls 11½.

Length 12, diam. 3.3 mm.; whorls 9½.

Length 9.3, diam. 2.8 mm.; whorls 8½.

Cuba: Paso Viejo, in the municipal district of Pinar del Rio (Chas. Wright).

Differs from *U. p. variegata* by its irregular sculpture.

49. U. PRESASIANA (Pfeiffer).

"Shell subrimate, cylindric turreted, thin, entire or truncate, finely and closely striate, pale corneous, pellucid, silky. Spire noticeably tapering above the middle, the vertex small. Whorls 14 in an entire specimen, 8 to 9 in truncate shells, a little convex, the last slightly protracted, subangular at the base. Aperture oblique, circular, the peristome continuous, narrowly expanded throughout. Internal column simple. Length of an entire specimen 13, diam. 2⅔ mm. (*Pfr.*).

Western Cuba: Hato Sagua, near the foot of Pan de Guajaybon, Pinar del Rio (Gundlach).

Cyl. presasiana PFR., Malak. Bl., xiii, 1866, p. 62; Monogr., vi, p. 372.—ARANGO, Contr., p. 115.

Specimens before me which seem to be referable to this species are very similar to *U. pocyana*, but more closely striate. The neck is extremely short, and sometimes the peristome is adherent above.

50. U. CONFERTA (Arango).

"Shell rimate, subcylindric, rather solid, somewhat closely striate, whitish; spire shortly truncate; suture impressed, not crenulate; whorls remaining 10, somewhat flattened, the last obsoletely carinate, shortly free; aperture subcircular, the peristome a little reflexed. Length of truncate shell 10, diam. 2½ mm. Internal column simple" (*Arango*).

Cuba.

Cyl. conferta AR., Proc. Acad. N. S. Phila. 1882, p. 108 (June 27).

No further information has been published.

51. U. ILLAMELLATA ('Wright' Pfr.). Pl. 42, figs. 86, 89, 90.

Shell subrimate, fusiform-turreted, rather thin, obliquely subarcuately striate, diaphanous, pale corneous. Spire a little swollen in the middle, the apex entire, rather obtuse or shortly truncate. Whorls 14 in an entire specimen, a little convex, the last shortly free, obliquely protracted, rounded, obsoletely compressed at the base, somewhat narrowed in front. Aperture oblique, subcircular; peristome narrowly expanded throughout. Internal column simple. Length 16½, diam. 4 mm. (*Pfr.*).

Western Cuba: La Palma, in district of Consolacion del Norte, Pinar del Rio province (Chas. Wright).

Cyl. illamellata Wright mss., PFR., Malak. Bl., xi, 1864, p. 130; Monogr., vi, p. 373.—SOWB., Conch. Icon., xx, pl. 10, f. 87.—ARANGO, Contr., p. 116.—*U. "mamillata* Wright," PILS. & VAN., Proc. A. N. S. P. 1898, p. 275.

The specimens from Wright before me are pale brown and rather opaque. The ribs are rather widely spaced, the intervals being about three times their width. There is no basal keel, but the whorl is noticeably compressed around the short axial chink. The short neck is round. All of the specimens I have seen are narrowly truncate.

Length 16.2, diam. 3.8 mm.; whorls 10½.

Length 14, diam. 3.6 mm.; whorls 9⅓.

The length of the neck varies a good deal, and it is often shorter than in the specimen figured.

53. U. MIXTA ('Wright' Pfr.). Pl. 42, figs. 91, 92.

Shell cylindric-turreted, the upper half tapering to a narrow truncation; rather thin, corneous or pale brown with lighter striæ. Surface but slightly shining, sculptured with sinuous, oblique, thread-like riblets, widely and unequally spaced. Whorls about 11, the upper convex, lower somewhat flattened, separated by an impressed suture; last whorl rounded below, shortly free in front. Aperture oblique, circular, the peristome narrowly expanded, reflexed and wider on the columellar margin. Axis slender and simple.

Length 14.5, diam. 3.5 mm.; whorls 11 (Pfeiffer's type).

Length 16, diam. 3 mm.; whorls 11⅓.

Length 13.8, diam. 2.8 mm.; whorls 10⅓.

Western Cuba: Sugar plantation *La Cochinata,* at Las Pozas, near the north coast, in dist. of Bahia Honda, prov. Pinar del Rio, under stones (Wright).

Cyl. mixta Wright mss., PFR., Malak. Bl., xii, 1865, p. 120; Monogr., vi, p. 381.—ARANGO, Contr., p. 121.

Closely related to *U. illamellata,* but narrower, with somewhat more spaced and more sinuous riblets.

54. U. ATROPURPUREA (Arango). Pl. 42, figs. 96, 97.

Shell cylindric, the upper third tapering; rather thin, *dark purple-brown.* Surface somewhat glossy, regularly sculptured with fine thread-like rib-striæ, which are nearly straight, narrow, and parted by intervals wider than the riblets. Whorls about 9, convex, the last continued free in a *rather long, descending round neck.* Basal keel faintly indicated or wanting. Aperture slightly longer than wide, subcircular, the peristome white, expanded, reflexed on the upper and columellar margins. Axis slender and straight.

Length 19, diam. 4.4 mm.

Length 17, diam. 4 mm.

Western Cuba: *La Jagua,* near La Palma, dist. Consolacion del Norte, Pinar del Rio (Arango).

Cyl. atropurpurea ARANGO, Proc. A. N. S. Phila. 1882, p. 106 (June 27, 1882).

The dark color, more regular and closer striation and longer

neck, separate this species from the allied *U. illamellata.* An entire shell has 13 whorls, according to Arango. The figures and description are from specimens sent by him.

55. U. SOLUTA (Pfeiffer). Pl. 42, figs. 93, 94, 95.

Shell fusiform, rather thin, slightly inflated in the middle, the upper third or more tapering to the narrow truncation; pale corneous. Surface rather glossy, densely and finely striate, the striæ smooth, about as wide as the intervals, becoming much coarser, *sharper and more widely spaced on the free portion of the last whorl.* Whorls 9-10, convex, the last *produced downward and forward in a rather long, round neck.* No basal keel. Aperture rounded-oval, longer than wide, the peristome continuous, the outer margin expanded, upper and columellar margins reflexed, whitish. Axis slender and straight.

Length 12.5, diam. 3.2 mm.; whorls 8½.

Length 13.8, diam. 3.1 mm.; whorls 9¾.

Length 14, diam. 3.5 mm.; whorls 9 (Pfr's type).

Western Cuba: Between Guajaybon and la Chorrera, Pinar del Rio, on walls, type loc.; S. Andres (Wright).

Cyl. soluta PFR., Mal. Bl., xi, 1863, p. 6; Monogr., vi, p. 374.—SOWERBY, Conch. Icon., xx, pl. 9, f. 75.—ARANGO, Contrib., p. 112.

Differs from *U. atropurpurea* by the longer neck, more coarsely sculptured than the rest of the shell, and the finer, closer striation of the spire, as well as the paler color.

Subgenus GONGYLOSTOMA Albers, 1850.

Urocoptis with one or more spiral axial lamellæ, the free edge of the lower lamella, at least in the upper whorls, being serrate, cut into teeth, or bearing spines directed radially and more or less toward the aperture. Early whorls generally lost from the adult shell; apical whorls smooth (except in *Fibricutis*); basal keel generally indistinct or wanting. Type *U. elegans* (Pfr.). (*Gongylostoma,* round mouth.)

Dentition quite various in regard to the number of teeth, see p. 110, but the teeth of the central row are wider than in *Idiostemma,* agreeing with *Cochlodinella* and *Autocoptis.*

This group comprises a great variety of shell-forms, from short and swollen to long and fusiform; the last whorl being either adnate to the preceding or projected in a long neck. The subgenus is characteristic of western Cuba, as *Idiostemma* is of eastern; only a few forms occurring in the east. Up to this time very few are known from central Cuba, east of Matanzas province. *Gongylostoma* is chiefly developed upon and near the Sierra de los Organos, including the lower continuation of the same mountain system eastward to Matanzas. To what extent they follow the hill country still further to the east remains to be determined; but Pinar del Rio apparently has the greatest variety of forms, as well as the largest number of species.

The subgenus was subdivided in my paper of 1898 according to the number of spiral axial lamellæ above the dentate basal one; but further study shows this to be in many cases a secondary character, even coloration and sculpture-pattern outranking it. There are many phyla in the group, more or less exactly parallel or homoplastic in internal structure, and so far as I can see, inter-related about as indicated in the accompanying diagram, in which the "*concreta* group" may perhaps represent primitive forms, since it is likely that the whole series arose from a stock in which there was one spiral axial lamella with a lower cord above it.

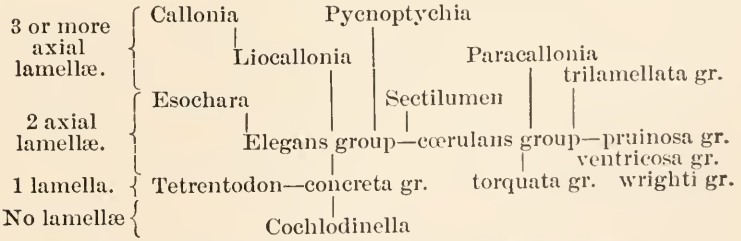


Diagram showing approximate relationships of West Cuban groups of Urocoptis.

The group of *U. elegans* is a middle point whence variously modified phyla radiate, the group of *U. cœrulans* another. The comparative lengths of some lines in the diagram are

somewhat out of proportion, in order to show the number of spiral lamellæ. Thus, *Pycnoptychia* is really as near as *Esochara* to the *elegans* group in structure In the *concreta-elegans-Liocallonia* series there is practically no modification in texture, form or onamentation externally.

In a number of groups, two parallel series of species, finely striate and spaced rib-striate or costulate, exist. This is especially noticeable in the group of *U. elegans* and phyla radiating therefrom.

Key to Sections of Gongylostoma.

I. Lower axial lamella expanding into a broad, flat or cup-shaped plate, in an intermediate whorl. Western Cuba.
Section *Esochara*, no. 58-60.

II. Two subequal axial spirals, the cavity of an intermediate whorl contracted by accessory lamellæ upon the parietal, basal and usually the outer walls. Eastern Cuba.
Section *Sectilumen*, no. 57.

III. Intermediate whorls without such special modifications of the lamellæ.

1. Shell small, pale, with nodose suture and fine, interlacing striæ; truncate, the rejected portion long, attenuate, with costulate apical whorls. Axis with one spinose lamella. Eastern Cuba.
Section *Fibricutis*, no. 56.

2. Rather large, uniform brown or corneous-brown; axis with 3 to 8 spiral lamellæ, increasing in size from the upper to the lowest, which is widest; rejected portion of spire short, not attenuate, apical whorls smooth; aperture not dark within.
Section *Pycnoptychia*, no. 61-66.

3. Axis with 3 thin spiral lamellæ, the upper widest, lower smallest in intermediate whorls; shell slender.

a. Shell sculptured with large, hollow ribs, very slender and many-whorled, attenuate above, whorls 30 to 40 in entire shells.
Section *Callonia*, no. 69, 70.

b. Shell merely striate or rib-striate, corneous or brownish, whorls less numerous, 10 to 25.
Section *Liocallonia*, no. 71-83.

4. Axis stout, with 3 nearly horizontal lamellæ, subequal in the intermediate whorls.
Section *Paracallonia*, no. 67, 68.

5. Axis with 1 to 3 lamellæ, the upper one thickened if wider than the lower, the latter spinose or serrate, at least in the earlier whorls.

a. Shell *plain corneous or brownish*, usually somewhat translucent, striate or with spaced riblets; axial lamellæ 1 to 3; the lower one serrate, at least in the upper whorls; aperture pale within. Shell usually rather small.
Section *Gongylostoma*, no. 84-114.

b. Shell rather long, light colored, with a more or less distinct *basal brown band;* last whorl adnate or but shortly free; axis straight above the single, serrate, sub-basal lamella.
Group of *U. torquata*, no. 115-125.

c. Shell opaque, dull, purplish or brown, with light riblets; aperture brownish inside; axis with 1 to 3 lamellæ, the lower projecting widest. Group of *U. trilamellata*, no. 137-143.

d. Shell variegated, corneous or brown and white.

aa. *Irregularly marbled,* and with *a series of white subsutural beads;* one or two axial lamellæ; basal keel indistinct.
Group of *U. coerulans*, no. 126-136.

bb. Irregularly marbled, nearly smooth, *the suture plain;* axis stout, with a low cord above the sub-basal lamella. Eastern Cuba. Group of *U. ventricosa*, no. 145.

cc. Brown with white-bordered dark stripes; *basal keel distinct;* axis with 2 subequal lamellæ. I. of Pines.
Group of *U. pruinosa*, no. 144.

dd. Corneous with sparse white stripes, or

white with corneous stripes; extremely slender, generally with a long descending neck; axis with a single small lamella. Central and eastern Cuba.
Group of *U. wrighti,* no. 146-151.

6. Axis with one or two weak spirals, not denticulate or spinose; shell very slender with round neck.
Section *Tetrentodon,* no. 152-166.

Section *Fibricutis* Pilsbry, 1903.

Small, cylindric and truncate, roughly striate, and crenate at the sutures, with a spinose axial lamella; the rejected whorls numerous, forming a slender, attenuate spire; 2¾ nepionic whorls vertically costulate. (*Fibra,* filament; *cutis,* skin.)

By the structure of the axis, the single species of this group would belong to *Gongylostoma* (in the wide sense); but by the external sculpture, and especially that of the nepionic shell, it approaches *Idiostemma.* The relationships of the group must be considered uncertain until the dentition is examined. It occurs in Santiago province, the *Idiostemma* country.

56. U. SCABROSA ('Gundl.' Pfr.). Pl. 58, figs. 69, 70. 71.

Shell small, cylindric-tapering, lustreless, pale fleshy, *densely sculptured with fine, interlacing white striæ,* forming an irregular fibrous or netted pattern; with *low white bosses below the suture,* and sometimes above it also. Spire slowly tapering, rather widely truncate; whorls convex, the last very shortly free. Aperture circular, the lip slightly expanded. Axis encircled by a small lower lamella, which is densely and delicately spinose, and a low, slightly spiral cord above it, both disappearing in the earlier whorls. About 11 early whorls are cast off, this portion being subulate, attenuated towards the noticeably bulbous apex, the nepionic shell consisting of 2¾ vertically costellate whorls.

Length 9.5, diam. 2.5 mm.; whorls 9-10.

Eastern Cuba: Yateras, under stones (Gundlach); Palenque, dist. of Alto Songo, prov. Santiago (Wright).

Cyl. scabrosa Gundl. mss., Pfr., Malak. Bl., vi, p. 98 (no description); ix, 1862, p. 131; Monogr., vi, p. 383.—Arango, Contrib., p. 123.—*Cyl. fibrosa* Gundlach mss. in some collections.

Exceedingly peculiar in the fibrous sculpture. The surface is more or less coated with calcareous earth, evidently held by the slime of the snail.

Section *Sectilumen* Pils. & Van., 1898.

Pilsbry & Vanatta, Proc. A. N. S. Phila. 1898, pp. 271, 276. Type and sole species *U. ornata.*

Urocoptis with two axial lamellæ, the upper cord-like, the lower acute and spinose, and in an intermediate whorl having an accessory lamella on the upper partition, a smaller one on the lower. Dentition as in *Gongylostoma* generally, the central teeth being wide (pl. 61, fig. 16). (*Sectus,* cut; *lumen,* window or opening.) Distribution eastern Cuba.

The single species composing this Section has external sculpture like *Maceo* or some forms of *Idiostemma,* and inhabits the same region; but the axial lamellæ and dentition are such as occur in *Gongylostoma.* The accessory lamellæ special to the group are homoplastic with those of typical *Holospira.* Nothing of the sort has been found in any other Antillean species. The sculpture of the early whorls is unknown. Like the preceding group, this does not seem closely related to those following. The number of teeth in a row is reduced to 8.1.8, as in the more specialized Gongylostomæ.

57. U. ornata ('Gundl.' Pfr.). Pl. 52, figs. 37, 38, 39, 40.

Shell *cylindrical,* the upper 2 or 3 whorls only tapering, solid, lustreless and opaque, light dull fleshy-brownish. Surface very densely and minutely striate, the striæ hair-like, and having a series of *white tubercles above and below the sutures.* Sometimes there are weak ribs unequally developed on some whorls, and the latter half of the last whorl may be ribbed. Whorls flattened, the suture impressed, the last whorl ribbed beneath, not carinate, projecting free in a rounded neck. Aperture oblique, oval, the lip thick, ex-

panded, Isabella tinted. Axis rather stout, with two lamellæ, the upper one a stout rounded cord, the lower narrow and spinose at the acute edge; in the intermediate whorls a low rounded cord revolves below the denticulate lamella. In the fifth whorl from the base the cavity is narrowed by a very strong, outward-flaring lamella hanging from the upper or parietal partition, and a corresponding, much lower plica on the floor or lower partition, each being fully one whorl long.

The young shell, according to Pfeiffer, is long and very slender, acutely produced, composed of about 12 whorls.

Length 11.5, diam. 2.5 mm.; whorls 12.

Length 10, diam. 2.7 mm.; whorls 10.

Length 12, diam. 2.75 mm.; whorls 12 (Pfeiffer's type).

Eastern Cuba: Yateras, Guantanamo (Gundlach); Yacabo-arriba, Baraeoa (Arango).

Cyl. ornata Gundlach mss., Pfr., Malak. Bl., vi, 1859, p. 97; Monogr., vi, p. 382.—Binney, Ann. N. Y. Acad. Sci., iii, p. 126, pl. 14, f. A (dentition).—Arango, Contrib., p. 122.—*Urocoptis* (*Sectilumen*) *ornata* Gundl., Pils. & Van., Proc. A. N. S. Phila. 1898, p. 276, pl. 17, f. 9 (interior).

Externally this species resembles *U.* (*Macco*) *interrupta*. Internally it has much in common with the typical section of *Holospira* (see pl. 21, 22). The lower or basal plica is sometimes weak or obsolete; and the outer wall of the constricted whorl is decidedly thickened, thicker than in preceding or following whorls, and bears a median low callus or cord, corresponding to that of Holospira. The finely denticulate axial lamella persists in the early whorls, the upper cord-like one being low or subobsolete there. There is individual variation of fully a half whorl in the number of whorls formed beyond the obstructed one. Figures 37 and 38 represent front and back views of the same shell.

Section *Esochara* Pils. & Van., 1898.

Esochara P. & V., Proc. A. N. S. Phila. 1898, pp. 271, 276, type *U. strangulata*.

Urocoptis with two axial lamellæ (the upper one sometimes vestigial), the lower denticulate in the upper whorls, then

expanding in a broad plate bisecting the cavity in one or two submedian whorls, reduced again below.

In *U. fabreana* the teeth (pl. 61, figs. 13, 14) are larger than in any other species of the family I have examined. The centrals are narrow, almost as in *Idiostemma*.

This group of western Cuba has apparently been specialized from an ancestral species belonging to *Gongylostoma* s. str. Its peculiar internal structure was noticed first by Poey.

Key to Species of Esochara.

I. Last whorl very shortly free in front; suture simple; shell rather large.

1. Brown, the length about 3½ times the diam.; two axial lamellæ in the upper whorls.

U. strangulata, no. 58.

2. Dull corneous or pale, the length 4 or 5 times the diam.; one axial lamella in the upper whorls.

U. fabreana, no. 59.

II. Last whorl produced in a long, descending neck; suture bordered below by white bosses; shell small.

U. teneriensis, no. 60.

58. U. STRANGULATA (Poey). Pl. 52, figs. 28, 29, 30.

Shell cylindric, the upper third rather rapidly tapering to a wide truncation; thin; dull brown. Surface lustreless, sculptured with oblique riblets separated by intervals of three or four times their width. Whorls slightly convex, the last rounded beneath, with a low cord-like basal carina, very shortly free in front. Aperture subcircular, but the upper external margin is noticeably straightened. Peristome thin, expanded and narrowly reflexed. Axis with two spiral lamellæ above, the lower one expanding in a broad, flat plate or spiral disk in the antepenult. and next earlier whorls, nearly reaching the outer wall of the cavity. In the last whorl the upper lamella is reduced to a rounded cord.

Length 22, diam. 6 mm.; whorls 10½.

Length 19, diam. 5.7 mm.; whorls 9½.

Western Cuba: Lomas de Candela, near Guines, prov. Habana (Gundlach).

Cyl. strangulata Poey, Memorias, ii, p. 31, pl. 1, f. 20-22 (1857).—Bland, Ann. Lyc. Nat. Hist. of N. Y., vi, 1855, p. 151, pl. 5, f. 18 (axis).—Gundlach, Malak. Bl., iv, 1857, p. 46 (color of soft parts).—Pfr., Conchyl. Cab., p. 19, pl. 8, f. 16, 17; Monogr., iv, p. 698.—Arango, Contrib., p. 110.—*Urocoptis* (*Esochara*) *strangulata* Poey, Pils. & Van., Proc. A. N. S. Phila. 1898, p. 276, pl. 18, f. 15 (axis).

The dilatation of the lower axial lamella is longer and wider than in *U. fabreana,* which further differs in proportions and color, and in having the upper axial lamella obsolete or nearly so. Figs. 29 and 30 represent front and back views of the same shell.

59. U. fabreana ('Poey' Pfr.). Pl. 52, figs. 32, 33, 34.

Shell long, cylindrical, the upper fourth or third tapering to a moderately wide truncation; somewhat solid, varying from wax-colored or whitish corneous to pale brown. Surface lustreless, sculptured with narrow oblique riblets separated by much wider spaces. Whorls nearly flat, the last rounded below, with a low cord-like basal keel, very shortly free in front. Aperture subcircular, the peristome thin, rather broadly expanding, hardly reflexed. Axis having, above the middle, a small sub-basal finely denticulate lamella, a scarcely noticeable low cord, or rather a slight sinuosity of the pillar, above it; in the antepenult whorl the lamella expands into a somewhat upward-flaring, broad plate.

Length 26.5, diam. 5.2 mm.; whorls 12.

Length 20.7, diam. 5.2 mm.; whorls 9⅔.

Length 22, diam. 5.66 mm.; whorls 12-13 (Pfr.).

Western Cuba: Seborucal, near San Antonio de los Banos, in the interior of Habana province (Fabre).

Cyl. fabreana Poey mss., Pfr., Malak. Bl., vi, 1859, p. 96, footnote; Novit. Conch., p. 245, pl. 63, f. 1-3; Monogr., vi, p. 366.—Arango, Contrib., p. 110.—Sowerby, C. Icon., xx, pl. 8, f. 70.—Crosse, J. de C., 1890, p. 220.

Related to *U. strangulata,* but of a more slenderly cylindrical shape, somewhat more finely ribbed, and differing internally in having the upper lamella obsolete, and the

expansion of the lower one somewhat less extensive, being both shorter and less broadly dilated. The pale, waxen color is a further distinction. There is the usual rather wide variation in size, but the other characters seem fairly constant in over twenty-five specimens examined.

60. U. TENERIENSIS ('Wright' Pfr.). Pl. 52, figs. 31, 35, 36.

Shell cylindrical, the upper third or less rather rapidly tapering to a somewhat narrow truncation; rather solid; corneous clouded with white. Surface lustreless, sculptured with fine, whitish, oblique rib-striæ much narrower than the intervals, and with a subsutural series of small *white nodules crenulating the suture*. Whorls but slightly convex, the last produced forward and descending in *a rather long, round, contracted neck*. Aperture subcircular, the peristome thickened, white, rather broadly reflexed. Axis with two subequal spiral lamellæ in the whorls above the middle, the upper lamella running to the last whorl, the lower lamella expanding in the antepenult. and next earlier whorls in a broad, saucer-shaped plate, about two whorls long.

Length 12, diam. 2.4 mm.; whorls 12.

Whorls 12.5, diam. 2.66 mm.; whorls 12-14 (Pfr.).

Western Cuba: The hacienda La Teneria, near Guane, Pinar del Rio (Wright).

Cyl. teneriensis Wright mss., PFR., Malak. Bl., xii, 1865, p. 121; Monogr., vi, p. 387.—ARANGO in Poey, Repert., ii, p. 270; Contrib., p. 126.—SOWERBY, Conch. Icon., xx, pl. 10, f. 84.—CROSSE, J. de C., 1890, p. 240.—? "*C. fineriæ* Wright," SCHAUFUS, in Paetel's Catal., p. 68.

A very distinct little species, notable for its variegated coloration, subsutural crenation, long neck and the long internal saucer-shaped spiral lamella. There is merely a slight trace of the basal keel. In color it reminds one of the variegated forms of the group of *U. coerulans*.

Section *Pycnoptychia* Pils. & Van., 1898.

P. & V., Proc. A. N. S. Phila. 1898, pp. 271, 275. Type *U. humboldtiana* Pfr.

Urocoptis with 3 to 8 spiral axial lamellæ, *increasing in size from the upper to the lower, which is largest,* and more or less crenate at the edge in the upper whorls. Last whorl shortly free, not descending, rounded beneath, the basal keel a low cord or obsolete. Sculpture of fine striæ. Spire shortly truncate, the abandoned portion of few (about 6-7) whorls, and not attenuate near the smooth apex.

A group of western Cuba, east to Matanzas, differentiated from typical *Gongylostoma* by the multiplication of axial lamellæ, the non-attenuate, short abandoned portion of the spire, and the larger size.

Key to Pycnoptychia, etc.

I. Surface finely and closely striate.
  1. Shell sinistral, very finely and closely striate. *U. scæva,* no. 64.
  2. Shell dextral.
    a. Axial lamellæ more than 3; diam. of shell one-fourth the length or less.
      b. Striæ close and fine, as wide as the intervals. *U. humboldtiana,* no. 61.
      bb. Striæ more spaced, the intervals wider. *U. h. peraffinis.*
    aa. Three axial lamellæ; diam. more than one-fourth the length; very densely striate, glossy. *U. striatella,* no. 63.

II. Surface dull, sculptured with spaced rib-striæ.
  1. Interior the color of the outside; shell but slightly tapering above, thin. *U. shuttleworthiana,* no. 65.
  2. Opaque; interior brownish or dark; sculpture of light riblets on a dark ground. Group of *U. trilamellata,* no. 139, etc.

U. torrei (no. 62), an insufficiently described species, is also provisionally included in this section; also *U. oviedoiana,* no. 66, the interior of which is unknown.

61. U. HUMBOLDTIANA (Pfeiffer). Pl. 47, figs. 77-81.

Shell cylindric, the upper third tapering to a rather wide

truncation, thin, pale brown or reddish-brown. Surface glossy, very densely sculptured with *fine, hair-like striæ, separated by intervals of the same width.* Whorls but slightly convex, the last very shortly free, having a low, cord-like keel below. Aperture subcircular, brown within, the peristome expanded and reflexed, whitish or brown-tinted. Axis encircled by three principal lamellæ, the lower one largest and denticulate above the middle; and in one or two median whorls low rounded cords are interposed above and below the lower lamella, and less conspicuously in the other intervals (fig. 78).

Length 27, diam. 6 mm.; whorls 11.

Length 22.5, diam. 5.7 mm.; whorls 10.

Length 22, diam. 5.5-6.5 mm.; whorls 11 (Pfr.).

Western Cuba: Near Cayajabos (E. Otto); Tetas de Managua (Poey); Camoa, Cuevas de Cotilla and Potrero Dique (Arango).

Cyl. humboldtiana Pfr. in Wiegm. Archiv f. Naturg., 1840, i, p. 252; Phil., Abbild., i, p. 184, pl. 1, f. 4; Mal. Bl., 1854, p. 210; Conchyl. Cab., p. 14, pl. 2, f. 20, 21; Monogr., ii, p. 373 (exclusive of var. *b*); iii, p. 570; iv, 699; vi, 368.—Gundlach, Malak. Bl., iv, 1857, p. 46 (descr. of animal.—Arango, Contrib., p. 111.—Binney, Ann. N. Y. Acad. Sci., iii, p. 125, and Proc. A. N. S. Phila. 1875, p. 252 (jaw and teeth).—*Urocoptis* (*Pycnoptychia*) *humboldtiana* Pfr., Pils. & Van., Proc. A. N. S. Phila. 1898, p. 275, pl. 18, f. 14 (axis).—*Helix columnella* Fér. Mus.? according to Pfr.

More lengthened and less swollen than *U. striatella,* and more closely striate than the following form. Figs. 78, 79, 80 are copies of Pfeiffer's original figures in Philippi's *Abbildungen.* Figs. 77, 78 (x 6) and 81 (nat. size) are from specimens.

Var. *peraffinis* Pils. n. v. Pl. 47, figs. 82-86.

Similar to *U. humboldtiana,* but somewhat more solid, less shining, and the striæ are *widely spaced,* especially on the spire. In the penult. whorl there are three or four, in the next earlier four subequal cords above the lower lamella, and one below it (fig. 86 x 6).

Length 28.8, diam. 6 mm.; whorls 11½.

Length 23.6, diam. 5.8 mm.; whorls 10½.

Length 27, diam. 5.3 mm.; whorls 13.

Length 26.5, diam. 5.5 mm.; whorls 16½ (spire perfect).

Western Cuba: San José de las Lajas, in the interior of Habana province (Gundlach).

Cyl. oviedoiana Orb., Pfr., Monogr., iii, 569; iv, 698; vi, 366; Conchyl. Cab., p. 22, pl. 3, f. 1, 2.—Bland, Ann. Lyc. Nat. Hist. of N. Y., vi, p. 151 (axis).—Poey, Memorias, ii, pl. 1, f. 24 (axis).—Gundlach, Malak. Bl., iv, 1857, p. 46 (coloration of animal, from Tetas de Managua).—Sowb., C. Icon., xx, pl. 2, f. 13.—Arango, Contrib., p. 109.—Crosse, J. de C., 1890, p. 219. Not *Pupa oviedoiana* Orbigny.

There is some variation in the lamellæ of the axis, but the thin wide lamella below is not so prominent in the last three whorls as in *U. humboldtiana,* and the others are more nearly equal in size. Ordinarily there are 10½ to 12 whorls. In a specimen with the spire complete (fig. 82 x 6) there are 16½ whorls, 6½ of them above the plug, the position of which is marked by a change in color. The apex is rather large and smooth. Figures 82, 83, 86 are magnified 6 diameters.

62. U. torrei (Arango).

"C. humboldtianæ proxima. Differt anfractibus 13, rarius 12 (in humboldtiana 12), minus rapide ad apicem attenuatis, convexioribus, valde conspicuis, necnon confertis Longitudo testa trunca [ta] 31-32 mill. Diam. 7, apert. 5. Columella biplicata, lamina antica magis extensa." (*Arango.*)

Western Cuba: Zapata, prov. Matanzas (La Torre).

Cyl. torrei Arango, An. Real Acad. Cien. etc. de Habana, xii, p. 282, no. 6 (1876); Contrib., p. 109.

Named for D. Carlos de la Torre, of Havana. The description is very unsatisfactory, and I give it in the original.

63. U. striatella ('Wright' Pfr.). Pl. 47, figs. 91-94.

Shell cylindrical, the upper third tapering to a wide truncation; thin, pale brown, often somewhat translucent. Surface glossy, *very closely and very finely striate,* the striæ hair-

like. Whorls slightly convex, the last shortly free in front, having a low, cord-like carina below. Aperture subcircular; peristome expanded and reflexed, white. Axis (fig. 93 x 6) provided with three spiral lamellæ, the lower one widest, its termination visible within the aperture, the upper one low and cord-like, obsolete in the upper whorls.

Length 21.5, diam. 5.7 mm.; whorls 9½.

Length 18, diam. 5.3 mm.; whorls 9⅓.

Length 19-22, diam. 6.5 mm.; whorls 8-11 (*Pfr.*).

Western Cuba: Punta de la Jaula, Guane, on rocks (Wright).

Cyl. striatella Wright mss., Pfr., Malak. Bl., xi, 1863, p. 2; Novit. Conch., p. 246, pl. 63, f. 4-6; Monogr., vi, p. 368.—Arango, Contrib., p. 111.—Sowerby, C. Icon., xx, pl. 7. f. 55.

Somewhat shorter and wider than *U. humboldtiana*, with distinctly finer striation, and not more than three axial lamellæ in any whorl. Figs. 91, 93 are magnified 6 diameters, the others natural size.

64. U. scæva ('Gundl.' Pfr.). Pl. 46, figs. 69, 70.

Shell sinistral, cylindric-tapering, rather widely truncate, brown. Surface somewhat glossy, very closely and finely sculptured with thread-like striæ. Whorls but slightly convex, the last shortly free in front, having a low cord-like basal keel. Aperture subcircular, the peristome expanded and reflexed. Axis provided with three spiral lamellæ, the lowest one the largest, extending nearly to the aperture, finely crenulate in the upper half of the shell; the upper lamella smallest.

Length 26, diam. 6 mm.; whorls 11.

Length 22, diam. 5.7 mm.; whorls 9½.

Length 24, diam. 5.7 mm.; whorls 11-12 (Pfr.).

Western Cuba: Ceiba Mocha, a R. R. station south of Pan de Matanzas, under stones (Gundlach).

Cyl. humboldtiana var., Pfr., in Phil., Abbild., vii, p. 8, pl. 3, f. 11; Conchyl. Cab., p. 15, pl. 2, f. 22, 23.—*Cyl. humboldtiana* Sowb., C. Icon., xx, pl. 3, f. 25.—*Cyl. scæva* Gundl. mss., Pfr., Malak. Bl., x, 1863, p. 248; Monogr., vi, p. 368.—Bld., Ann. Lyc. N. H. of N. Y., viii, 1865, p. 161, f. 4 (denti-

tion); Proc. A. N. S. Phila. 1875, p. 222, f. 64 (dentition).—Crosse & Fischer, Journ de Conch., 1870, pp. 9, 12 (jaw and teeth).—Arango, Contrib., p. 111.—Sowb., C. Icon., xx, pl. 14, f. 122.

Intermediate between *U. humboldtiana* and *U. striatella* in shape, but constantly sinistral. The axis is like that of *U. striatella*. It was this form which Pfeiffer at one time reported from Jamaica (see C. B. Adams, Contrib. to Conch. no. 3, p. 39), and figured as a variety of *U. humboldtiana*. He found a fragment on the beach at Matanzas, doubtless washed down from inland, the locality of the species being from south of the fine mountain Pan de Matanzas.

65. U. SHUTTLEWORTHIANA (Poey). Pl. 47, figs. 89, 90 (x 6); pl. 46, figs. 75, 76.

Shell cylindric, slowly tapering to a wide truncation above, rather thin, dull or violaceous brown. Surface nearly lustreless, sculptured with narrow whitish and but slightly arcuate riblets, *the intervals wide,* about 4 times the width of the riblets. Whorls slightly convex, the last very shortly free in front, having a cord-like keel below. Aperture subcircular, colored within like the outside; peristome thin, expanded and subreflexed. Axis encircled by three lamellæ, the lower one widest, crenate above the middle, extending to the last whorl, the others becoming obsolete in the penult. whorl; the upper lamella is merely a low rounded cord and about two whorls long. In the third whorl from below there is a low cord below the wide lower lamella.

Length 27, diam. 6 mm.; whorls 10¾.

Length 22, diam. 5.5 mm.; whorls 8⅔.

Western Cuba: Near Managua, on the plantation "Almirante" (Poey); town of Santo Cristo de la Salud, in the jurisdiction of Bejucal, prov. Habana (Arango).

Cyl. shuttleworthiana Poey, Memorias, ii, p. 31, pl. 1, f. 23, axis (1857).—Pfr., Conchyl. Cab., p. 18, pl. 2, f. 28, 29; pl. 8, f. 22; Monogr., iv, 698.—Arango, Contrib., p. 109.—Sowerby, C. Icon., xx, pl. 3, f. 23.

Poey justly remarks that *C. oviedoiana* (= *U. h. peraffinis*)

is intermediate between *U. shuttleworthiana* and *U. humboldtiana*. *U. shuttleworthiana* has 30 to 40 riblets on the penult. whorl, *peraffinis* has nearly 70, and *humboldtiana* 140. The first is lustreless, *peraffinis* nearly so, and *humboldtiana* is rather glossy. Aside from these external features, the present species has great similarity to *U. vignalensis*, having about the same internal structure; but the interior is not darkened as in *vignalensis* and its allies, species which I now place in a different phylum, believing the similar axial structure to be homoplastic rather than in the strict sense homologous.

66. U. OVIEDOIANA (Orbigny). Pl. 47, figs. 87, 88.

Shell much lengthened, cylindric, thin, brown; marked longitudinally and a little obliquely with equal plicæ, stronger in front. Spire very long, cylindric, noticeably tapering and truncate in adults, no doubt acuminate and acute in the young; composed of 12 narrow, flat whorls, the last a little detached near the mouth, and carinate below. Aperture produced quite laterally, oval, oblique, the peristome thin and sharp, much dilated and continuous. Length 28, diam. 5 mm. (*Orb.*).

Cuba: In the interior (de la Sagra).

Pupa oviedoiana ORB., Hist. Cuba, Moll., i, p. 182, pl. 12, f. 15, 16.—*C. oviedoiana* Orb., PFR., Monogr., ii, p. 380.

If Orbigny's figures copied on my plate are reasonably accurate, the shell usually known as *oviedoiana* is pretty certainly not correctly identified. It differs from these figures in being stouter, with notably shorter neck and much closer striation. Moreover, the apex is more obtuse; though from the wording of Orbigny's description, it is not certain that he had any specimen with the spire entire, even though he so figures it.

Section *Paracallonia* Pilsbry, 1902.

Urocoptis with *three axial lamellæ subequal in the median whorls*, the lower lamella denticulate, at least in the upper whorls. Basal keel of the last whorl weak. Type *U. albo-*

crenata, pl. 48, figs. 7, 8, 12. (*Para,* beside; *Callonia,* the following group.)

The axis in this group is intermediate between that of *Pycnoptychia,* in which the lower lamella is widest, and *Callonia,* in which the upper one dominates in the median whorls. There are two species, *U. albocrenata,* with a variegated shell, bead-strung below the suture, in external features closely imitating some forms of the group of *U. coerulans,* and *U. triplicata,* plain with the suture simple. Both are from western Cuba.

67. U. ALBOCRENATA ('Gundl.' Pfr.). Pl. 48, figs. 7, 8, 12.

Shell cylindric or swollen in the middle, the upper fourth tapering to a wide truncation, rather thin, marbled white and translucent-corneous. Surface rather glossy, sculptured with oblique low rib-striæ, and with a conspicuous row of *white nodules below the suture.* Whorls slightly convex, the last very shortly free or rarely adnate, rounded below, with a very low basal cord. Aperture subcircular, the white peristome expanded and reflexed. Axis very slender above, somewhat swollen below the middle, encircled with three subequal lamellæ, the lower one slightly predominating in the penult. and next earlier whorls, denticulate, the upper lamella equaling it in the next two whorls upward.

Length 14, diam. 3.3 mm.; whorls 11½.

Length 13, diam. 3.5 mm.; whorls 11-12 (Pfr.).

Length 11.2, diam. 3.1 mm.; whorls 10½.

Western Cuba: Catalina de Guane, Pinar del Rio (Wright).

Cyl. albocrenata Gundl. mss., PFR., Malak. Bl., xi, 1863, p. 7, no. 51; Monogr., vi, p. 373.—ARANGO, Contrib., p. 116.—SOWB., C. Icon., xx, pl. 4, f. 27.

Somewhat like *U. perlata* of eastern Cuba, but *albocrenata* differs by the strong striation and marbled coloration, and has a wholly different type of axial sculpture. It varies from a strictly cylindric shape to moderately swollen.

68. U. TRIPLICATA (Arango).

Shell subrimate, cylindric-turreted, rather solid, remotely

thread-striate, straw colored. Spire long, a little more swollen in the middle, the apex generally truncate, whorls 15-16; rather flattened, the last shortly free, not carinate. Aperture subcircular; peristome white, equally reflexed throughout. Suture deep, not crenulate. Internal column strong, provided with three equal, parallel lamellæ. (*Arango.*)

Length 14, diam. 3 mm. (spire entire).

Western Cuba: "La Jagua," near La Palma, dist. of Consolacion del Norte, in Pinar del Rio, on the plantation of D. Rafael Azcui (Arango).

Cyl. triplicata Arango, Proc. A. N. S. Phila. 1882, p. 105.

"Differs from all Cuban Cylindrellas by the form of the internal column. In shape the shell is similar to *C. lirata* (Jim.) and *C. mixta* (Wr.)."

It may be near *U. albocrenata,* but it is not variegated and the suture is simple.

Section *Callonia* Crosse & Fischer, 1870.

Callonia C. & F., Journal de Conchyliologie for 1870, p. 18. Type and sole species *Cyl. elliotti* Poey.—Pilsbry & Vanatta (in part), Proc. A. N. S. Phila. 1898, pp. 271, 276.

Urocoptis with *three axial lamellæ, the upper one largest* in the median whorls, the lower lamella denticulate or spinose. *Surface sculptured with large hollow ribs.* Type *U. elliotti,* pl. 48, figs. 1, 2, 3. (*Kallone,* elegance.)

MM. Fischer and Crosse considered the dentition to be quite divergent from that of other *Urocoptis;* but while somewhat specialized by reduction of the number of teeth, it is not more so than in many Cuban forms of *Gongylostoma,* and gives no ground for ranking *Callonia* higher than numerous other phyla in the genus. See pl. 60, fig. 9, *U. dautzenbergiana.*

Callonia is like *Liocallonia* in the structure of the pillar, the attenuated early whorls and smooth apex, but it is aberrant in the sculpture of hollow ribs, homoplastic with those of *Idiostemma, Holospira minima,* etc., and representing the acme of sculptural modification in this family.

There are two species of *Callonia: U. elliotti,* in which the last whorl is adnate or very shortly free, and not descending,

and with high, subtriangular ribs, and *U. dautzenbergiana,* with the last whorl free and descending, and having lower ribs. These two forms were noticed by Poey, who, however, did not consider them specifically distinct. In the "Memorias sobre la Historia Natural de la isla de Cuba," II, p. 93, he states that they occupy separate areas half a league apart, the one (*elliotti*) on the mountain called Guane, the other (var. *b,* now *dautzenbergiana*) on that called Paso-Real. They were finally separated by Crosse in 1890.

69. U. ELLIOTTI (Poey). Pl. 48, figs. 1, 2, 3.

Shell long-turrete, much attenuated above, rather rapidly increasing in size above the middle, the lower half (or more in truncate shells) much wider and somewhat cylindrical. Spire normally entire or nearly so. Surface golden brown, with a silken lustre, between *elevated, triangular, white hollow ribs,* 8 in number on the penult. whorl; these ribs reduced to low riblets on the attenuated upper portion of the spire. Whorls about 32, convex, the last rounded below, *not descending, very shortly free in front.* Aperture obliquely oval or subcircular, the peristome thickened and reflexed. Axis encircled with three lamellæ, the upper one largest in the intermediate whorls, the lowest lamella smallest and set with small, delicate, wide-spaced spines.

Length 24, diam. 3.5-3.8 mm.

Length 25, diam. 4 mm. (Poey).

Western Cuba: Sierra de Guane, Pinar del Rio (Elliott, Arango), on walls exposed to the sun.

Cyl. elliotti POEY, Memorias, ii, pp. 37, 93, pl. 5, f. 1, 2 (1857).—PFR., Malak. Bl., v, 1858, p. 7; Monogr., iv, p. 706; Novit. Conch., p. 458, pl. 100, f. 20-22 (exclusive of var.).—CROSSE & FISCHER, Journ. de Conch., 1870, pp. 9, 12, 25, pl. 3, f. 9-13 (teeth).—ARANGO, Contrib., p. 123.—SOWERBY, C. Icon., xx, pl. 6, f. 47 *a*.—CROSSE, Journ. de Conchyl., 1890, p. 211, pl. 4, f. 5.

Closely related to the next species. Named for the son of Bishop Stephan Elliott, who first found the species.

70. U. DAUTZENBERGIANA (Crosse). Pl. 48, figs. 4, 5, 6.

Shell similar to *U. elliotti,* from which it differs in the following characters: It is more lengthened, and *tapers more gradually;* there are more whorls, 33 or 34 (to about 40, according to Poey); the *last third or half of the last one free and descending.* The ribs are less elevated and less triangular, and extend further up the spire.

Length 27.5-31, diam. 3 mm.

Western Cuba: Paso-Real de Guane (Elliott *et al.*).

Cyl. elliotti var. b, POEY, Memorias, ii, p. 37, pl. 5, f. 3, 4.—PFR., Novit. Conch., pl. 100, f. 23, 24.—SOWERBY, C. Icon., xx, pl. 6, f. 47 *b.*—*C. dautzenbergiana* CROSSE, Journ. de Conchyl., 1890, p. 212, pl. 4, f. 6.—PILS. & VAN., Proc. A. N. S. Phila. 1898, p. 276, pl. 18, f. 18 (axis).

Readily distinguished from *U. elliotti* by the more gradually tapering spire and free, descending last whorl. In a large series of both species these differences are constant, and support Crosse's opinion of the specific value of *U. dautzenbergiana.* It is named for one of the present editors of the *Journal de Conchyliologie.* For the dentition see p. 110.

Section *Liocallonia* Pilsbry, 1892.

Callonia, somewhat smooth species, PILS. & VAN., Proc. A. N. S. Phila. 1898, p. 276.

Urocoptis with three axial lamellæ, the upper one thin, *decidedly the largest of the three in the median whorls;* the lower one denticulate or spinose. Surface smoothish, striate or with thread-like rib-striæ. Type *U. vincta.*

The dentition of *U. vineta* (pl. 63, fig. 1) does not differ materially from that of *U. elegans,* etc. The lateral teeth decrease in size very slowly, only the outermost two or three being noticeably shortened. The ectocones are large, and the teeth crowded. It is for the genus a normal and unspecialized radula. The shell is also relatively unspecialized, the sculpture being of primitive type, and the last whorl but shortly free.

This series is akin to the group of *U. angustior,* being differentiated therefrom only by the invariable presence of three

axial lamellæ, the upper one widest. It is also related to *Callonia,* from which the weak external sculpture alone separates it. The typical group of *Gongylostoma* (*U. elegans,* etc.) also is allied, but here the median lamella when present is short and low, and the upper one is thickened, and scarcely larger than the lower lamella. The species of *Liocallonia* are only feebly differentiated and very difficult to distinguish.

Key to Species of Liocallonia.

I. Shell sculptured with thread-like rib-striæ.
   1. Length 16-18 mm., with 15 whorls in truncate, 20 in entire specimens; axial lamellæ strong and subequal in penult. whorl. *U. guirensis,* no. 71.
   2. Length 17, diam. 3 mm., whorls 13; obliquely costulate-striate; 3 lamellæ in median, 2 in last whorl. *U. stearnsi,* no. 72.
   3. Smaller, having spaced riblets like *U. blainiana,* but riblets the color of the shell; axis 3-lamellate, the upper lamella larger. *U. palmæ,* no. 73.
   4. Length 12-13 mm., with 12-13 whorls remaining in the truncate shell; median lamella smaller in penult. whorl. *U. infortunata,* no. 74.

II. Shell finely striate or nearly smooth.
   1. Three subequal lamellæ in the penult. whorl, viewed from behind,
      a. Entire with 17-19 whorls, or narrowly truncate with 13-15; length 12-14 mm.; brownish corneous. *U. brunnescens,* no. 80.
      b. Truncate, with 15-17 whorls, length 14½-16½ mm.; pale corneous; nearly smooth, but with strong striæ below the sutures. *U. clara,* no. 81.
      c. Truncate, with 9½-11 whorls, length 11-12½ mm.; very finely striate. *U. propinqua,* no. 82.
   2. Median lamella reduced or obsolete in penult. whorl.
      a. Lower lamella enlarged and stout in the back of last whorl, and weakly emerging at the lip; shell rather widely truncate, with 12-14 whorls; length 11½-16 mm. *U. vincta,* no. 83.

a^1. Lower lamella slender in the last whorl.

b. Truncate, with 12 whorls, length 11-13 mm. *U. oligomesus,* no. 79.

c. Entire or narrowly truncate; whorls 16 in truncate, 19-23 in entire shells; length 13-16 mm.

U. saxosa, no. 77; *U. patruelis,* no. 78.

d. Entire or narrowly truncate; whorls 18-20 in entire shells; length 11-13 mm.

U. notata, no. 76.

U. cæciliæ, no. 75, described as similar to elegans but with four lamellæ, may belong to this group, or to the typical group of *Gongylostoma.*

71. U. GUIRENSIS ('Gundl.' Pfr.). Pl. 48, figs. 9, 10, 16.

Shell cylindrical, the upper third or fourth rather rapidly tapering to a narrow truncation; thin, corneous or whitish-corneous, lustreless, regularly sculptured with *narrow white riblets,* which are arcuate or nearly straight, but slightly oblique, and separated by intervals about three times the width of the riblets. Whorls slightly convex, the last rounded and very weakly, obtusely keeled below, shortly free in front. Aperture subcircular, the peristome narrowly reflexed. Axis with three lamellæ, all continuing into the last whorl, subequal in the penult. whorl, but in the median whorls the upper one is much the largest, and the lower smallest (fig. 16).

Length 16.5, diam. 2.6 mm.; whorls 15 (spire truncate).

Length 17.5, diam. 3 mm.; whorls 20 (Pfr.; spire entire).

Western Cuba: Sierra de Guira, dist. Santiago de los Banos, Piñar del Rio, on moss-covered stones in shady places (Gundlach).

Cyl. guirensis Gundlach mss., PFR., Malak. Bl., xi, 1863, p. 11, no. 60; Monogr., vi, p. 379.—ARANGO, Contrib., p. 120.

Well distinguished by the thread-like riblets and the disparity in size of the lamellæ in the median whorls, as shown in the upper part of fig. 16.

72. U. STEARNSI (Gundlach).

Shell shortly rimate, cylindric-turrete, truncate, obliquely

costulate-striate, opaque, pale corneous. Spire a little tapering above, the 13 remaining whorls rather flattened, the last shortly free in front, more strongly costulate-striate, angular at the base. Aperture oblique, subcircular, the peristome white, equally expanded and a little reflexed throughout. Internal column with 3 lamellæ in the median whorls, the upper one wider; in the last whorl there are 2 lamellæ (*Gundl.* in Arango). Length 17, diam. 3 mm.; diam. apert. 2.5 mm.

Western Cuba: Under stones at Sabana de Robles, near Madruga, prov. of Habana.

Cyl. stearnsi Arango, Contrib., p. 114 (description quoted from Gundlach mss.).

Probably belongs to *Liocallonia,* but the description of the axis also fits some of the *U. elegans* group.

73. U. palmæ ('Gundl.' Arango).

Differs from *Cyl. blainiana* by having the riblets the color of the shell, and the internal columella 3-lamellate, the upper lamella larger (while in *blainiana* it is nearly simple) (*Arango*).

Western Cuba: Between Palma and Caiguanabo, in Pinar del Rio (Wright).

Cyl. palmæ Gundl. mss., Arango, An. Real Acad. Cien, etc., de la Habana, xii, p. 285, no. 16 (1876); Contrib., p. 119.

74. U. infortunata (Arango). Pl. 48, figs. 11, 14, 15.

Shell cylindrical, the upper third tapering to a rather wide truncation; thin, corneous, subtransparent. Surface glossy, *sculptured with thread-like riblets, separated by intervals of double or three times their width,* somewhat stronger on the neck. Whorls convex, the last rounded below, grooved below the axial chink, produced in a slightly descending neck in front. Aperture circular, oblique, the lip thin, narrowly reflexed. Axis with three lamellæ, the upper one much the larger in the intermediate whorls, middle lamella smallest, lower lamella with distant delicate spines, which are wanting in the two lower whorls (fig. 14).

Length 12, diam. 3 mm.; whorls 10½.

Length 13, diam. 3 mm.; whorls 12 (Arango).

Western Cuba: La Chorrera, near Vinales, Pinar del Rio (Arango).

Cyl. infortunata Arango, Proc. A. N. S. Phila. 1882, p. 106 (June 27, 1882); 1884, p. 212, fig. 4.

Much more strongly sculptured than *saxosa, vincta, brunnescens* and *clara*. The name alludes to the broken condition of the original specimen. Figured from a topotype received from Arango.

75. U. cæciliæ ('Gundl.' Arango).

Very closely related to *Cyl. elegans,* but strongly striate, the whorls less flat, suture deeper and generally the whorl is brownish below it. Internal column with four lamellæ in the median whorls, the upper lamina dilated; in the last whorl it has two lamellæ (*Arango*).

Western Cuba: On the plantation "Union" or "Dos Cecilias" near Coliseo, district of Guamacaro, prov. Habana.

Cyl. cæciliæ Gundl. mss., Arango, Anales de la Real Acad. Cien. Med., Fis. y Nat. de la Habana, xii, p. 284 (1876); Contrib., p. 113.

Known to me by the above description only. Not figured.

76. U. notata ('Gundl.' Pfr.). Pl. 51, figs. 15, 16, 17, 24, 25, 26, 27.

Shell slender, turreted, nearly regularly tapering, or with the upper third more rapidly decreasing, thin, corneous, somewhat transparent; somewhat glossy, obliquely and very closely striate. Whorls 18-20, rather convex, the last produced forward and somewhat descending, with no trace of a basal keel, the neck sharply but still closely and finely striate. *The spire is entire* or merely the tip may be broken, the nepionic shell consisting of about 2½ rather globose whorls. Aperture oblique, subcircular, the peristome white, somewhat thickened and reflexed. Axis slender, with three delicate lamellæ, the upper largest in the intermediate whorls, the lower smallest, armed with rather long, obliquely placed

spines. The upper and middle lamellæ beeome obsolete in the penult. whorl (pl. 51, fig. 24).

Length 13, diam. 2.3 mm.; whorls 20.

Length 12.7, diam. 2 mm.; whorls 19.

Length 11.2, diam. 2 mm.; whorls 18.

Western Cuba: Sierra de Guira, at San Diego de los Banos (Gundlaeh); Rangel and Mogotes de Galalon (Arango); San Andres (Chas. Wright), all in prov. Pinar del Rio.

Cyl. notata Gundlaeh mss., Pfr., Malak. Bl., xi, 1863, p. 10; Monogr., vi, p. 372.—Arango, Contrib., p. 116.—Crosse, J. de C., 1890, p. 228.—Sowerby, Coneh. Ieon., pl. 11, f. 102.

There is sometimes a pale brown band at the periphery and following the suture, as noted in the original deseription; but this is wanting in most of the individuals I have seen.

It is smaller than *U. saxosa* and *brunnescens*, with more whorls in the same length. The apex is either entire or nearly so, and the striation of the neck, while becoming thread-like, is not more spaeed than on the spire.

In some speeimens the median lamella of the axis is wanting, the lower one with very delieate, thread-like white spines (pl. 51, figs. 26, 27). I ean see no other differenee whatever between these and the typieal form. Figs. 15, 16, 17, 24 are from S. Andres speeimens; figs. 26, 27 are from Rangel.

77. U. saxosa (Poey). Pl. 51, figs. 4-6, 20.

Shell slightly rimate, frequently not rimate, eylindric-turrete, entire, very rarely truneate, obliquely striate, glossy, glassy and pale eorneous. Spire attenuate above; suture simple; whorls 23 in an entire speeimen (16 in a truncated shell), eonvex, the last free in front, elosely costulate, eompressed near the rima, elsewhere eylindrical. Aperture oblique, subeireular; peristome white, equally expanded and a little reflexed throughout. Length 16, diam. 2⅓ mm. (Poey).

Western Cuba: Sierra del Rangel, on marble roeks (Poey, Arango); Sierra del Rosario at San Cristobal (Cisneros), and the eoffee plantation of San Leon (Gundlaeh), all in Pinar del Rio.

Cyl. saxosa Poey, Memorias, ii, pp. 31, 61, pl. 3, f. 10, 11

(1857).—Arango, Contrib., p. 115.—Crosse, J. de C., 1890, p. 228.—? *C. volubilis* Pfr., Conchyl. Cab., p. 24, pl. 3, f. 15-17.

The specimens figured are from Rangel, the type locality. It is a corneous, subtranslucent shell, with the apex perfect or narrowly truncate. The upper third tapers rather rapidly, the rest of the shell being subcylindric; last whorl more or less free and *descending*. There is no basal keel. The axis bears three lamellæ, the upper one in the intermediate whorls is decidedly largest, the lower one smallest, and bearing slender, rather long widely spaced spines (short in some specimens). The size and number of whorls varies a good deal.

Length 14.5, diam. 2.3 mm.; whorls 22½ (spire complete).

Length 13, diam. 2.3 mm.; whorls 19 (spire complete).

Arango has called attention to the diverse sculpture of the axis in this species and *C. volubilis* Morel., a species with which Pfeiffer united *saxosa*.

78. U. patruelis (Arango).

Very like *Cyl. saxosa* Poey, but distinct by the very wide upper lamella of the trilamellate internal column, the lower lamella but little prominent; by the wider shell, less produced last whorl, flatter and more widely spaced riblets (*Arango*).

Western Cuba: Plantation San Felipe Benicio, near Candelaria, Pinar del Rio (Arango).

Cyl. patruelis Ar., An. Real Acad. Cien., etc., de la Habana, xii, p. 283, no. 11 (1876); Contrib., p. 115.

79. U. oligomesus Pilsbry, n. sp. Pl. 48, fig. between 8 and 12, and fig. 13.

Shell cylindric in the lower half, the upper half tapering to a moderately wide truncation; thin, corneous, subtransparent, often reddish-brown or dusky above from the contained soft parts. Surface glossy, finely and regularly striate, the striæ low, but on the last half whorl becoming thread-like and sometimes more spaced. Whorls convex, the last free, produced in a short neck. Aperture circular, the lip equally expanded and reflexed throughout. Axis with three lamellæ, the upper widest, median lamella very low, smallest,

the lower lamella rather distantly and subobsoletely dentieulate (pl. 48, fig. 13).

Length 13, diam. 3 mm.; whorls 12.

Length 11, diam. 2.5 mm.; whorls 12.

Cuba: Los Cayos de San Filipe, distriet of Vinales, prov. Pinar del Rio (Chas. Wright).

Near *U. saxosa,* from whieh it differs ehiefly by the much redueed median axial lamella. *U. propinqua* is somewhat more finely striate, and has the three lamellæ well developed in the penult. whorl, while in *U. oligomesus* the upper two are weak there. Some shells before me from Vinales, in whieh the striation is nearly effaced except near the sutures, seem to be referable to this species.

80. U. BRUNNESCENS ('Gundl.' Pfr.). Pl. 51, figs. 1-3, 18.

Shell eylindrie below, the upper half or less tapering to a narrow truneation or an entire apex; *brownish-corneous,* thin, glossy, seulptured with fine and subobsolete but rather regular striæ, beeoming stronger, thread-like on the last whorl; the intervals as wide as the striæ. Whorls eonvex, the last rounded beneath, without a earina, shortly free and deseending in front. Aperture subeireular or obliquely rounded-oval; peristome white, narrowly reflexed. Axis with three lamellæ, the upper one mueh the largest in the intermediate whorls, lower lamella smallest, distantly spinose. In the penult. whorl the three lamellæ are subequal (fig. 18).

Length 14.5, diam. 2.8 mm.; whorls 15 (truneate).

Length 12, diam. 2.5 mm.; whorls 13 (truneate).

Length 12.3, diam. 2.7 mm.; whorls 17½ (apex entire).

Length 13-14, diam. 2.5 mm.; whorls 15-19 (Pfr.).

Western Cuba: Hato Caimito, near the Pan de Guajaybon, Pinar del Rio, on stones (Gundlach, Wright).

Cyl. brunnescens Gundl. mss., PFR., Malak. Bl., xi, 1863, p. 8, no. 53; Monogr., vi, p. 376.—ARANGO, Contrib., p. 118.—SOWB., C. Icon., xx, pl. 10, f. 92.

The figures are from topotypes. It seareely differs from *U. saxosa* externally, exeept by the brown tint; but the three lamellæ are stronger and subequal in the penult. whorl, as in *U. propinqua.*

81. U. CLARA ('Wright' Pfr.). Pl. 51, figs. 11, 12, 13, 14, 22.

Shell cylindric, the upper third slowly tapering to a rather wide truncation, thin, pale corneous, translucent, the axis showing through; surface glossy, *smooth, with short, rather coarse, low striæ below the sutures,* the last whorl distinctly striate, its latter half having well spaced thread-like rib-striæ, becoming more crowded near the lip. Whorls 15-17, moderately convex, the last becoming free and descending in front, rounded and without a carina below, the neck white above, and grooved below the umbilical chink. Aperture circular, the peristome narrowly reflexed. Axis with three lamellæ, the upper quite wide, the lower very small and bearing *very widely spaced, long, curved and very delicate white spines.*

Length 16.5, diam. 3.2 mm.; whorls 16½.

Length 14.6, diam. 2.8 mm.; whorls 15.

Length 15, diam. 3 mm.; whorls 16-17 (Pfr.).

Western Cuba: Sugar plantation Quinones, near Bahia Honda, Pinar del Rio (Wright).

Cyl. clara Wright mss., PFR., Malak. Bl., xii, 1865, p. 119; Monogr., vi, p. 362; Novit. Conch., p. 436, pl. 97, f. 18-21.—ARANGO in Poey, Repert, ii, p. 270; Contrib., p. 108.—SOWB., Conch. Icon., xx, pl. 9, f. 82.

The short, subobsolete striæ under the suture are characteristic. It is somewhat larger than *U. brunnescens* with more whorls and different sculpture, and the lamellæ differ somewhat, especially in the last whorl.

82. U. PROPINQUA ('Gundl.' Arango). Pl. 51, figs. 19, 23.

Shell subrimate, cylindric-turreted, rather solid, nearly smooth, whitish; spire generally truncate; suture subcrenulate. Whorls remaining 11-12, nearly flat, the last not keeled at the base, striated anteriorly, shortly free. Aperture subcircular; peristome a little reflexed, the right margin usually somewhat sinuate within by the descent of the internal fold. Internal column three-plicate, the upper fold widest (*Arango*). Dimensions not stated.

Western Cuba: Vinales, Pinar del Rio, in the same locality with *C. capillacea.*

Cyl. propinqua Gundl., ARANGO, Proc. Acad. N. S. Phila. 1882, p. 108 (June 27, 1882).

The original description is translated above. Associated with specimens of *U. capillacea* collected at Vinales by Chas. Wright, I found a number of tri-lamellate shells (pl. 51, figs. 19, 23) no doubt referable to *U. propinqua.* They are rather broadly truncate, corneous or slightly yellowish corneous, a little more finely striate than *U. saxosa,* but the striæ are low and subobsolete, glossy, the striæ closer on the neck than in *U. saxosa* and allied species. The axis has three strong lamellæ, subequal in the penult. whorl, above which the upper lamella decidedly dominates, the other two being about equal, the lower one rather distantly spinose. In the tapering upper whorls the median lamella disappears, the other two being about equal, the lower one rather closely serrate. It resembles the pillar of *U. brunnescens* (pl. 51, fig. 18) so closely that I have thought it superfluous to figure both.

Length 12.4, diam. 3 mm.; whorls 11.

Length 11, diam. 2.8 mm.; whorls 9½.

The truncation is broader than in *U. saxosa.*

83. U. VINCTA ('Gundl.' Pfr.). Pl. 51, figs. 9, 10, 21, and fig. above f. 8.

Shell cylindrical, the upper third tapering to a moderately wide truncation, thin, corneous, more or less translucent; glossy, nearly smooth, sculptured with low, often nearly obsolete, rather coarse, weak striæ, becoming distinct and rather crowded on the last half whorl. Whorls moderately convex, the last rounded beneath, free in front, the neck grooved below the umbilical chink. Aperture subcircular, oblique, the peristome white, narrowly reflexed, the columella provided with *an emerging fold* below. Axis with three lamella, the upper one wide in the intermediate whorls, the median lamella smallest, obsolete in the penult. whorl,

the lower lamella small, more or less crenulate, *becoming very strong in the last whorl, and weakly continued below to the lip.*

Length 15, diam. 2.8 mm.; whorls 14.

Length 12.5, diam. 3.2 mm.; whorls 12.

Length 11½-16, diam. 3 mm.; whorls 12-13 (*Pfr.*).

Western Cuba: Hato Sagua, at the foot of the Pan de Guajaybon, Pinar del Rio, on rocks in shady forests (Gundlach).

Cyl. vincta Gundlach mss., Pfr., Malak. Bl., xi, 1863, p. 7, no. 52; Novit. Conch., p. 434, pl. 97, f. 8-11; Monogr., vi, p. 361.—Arango, Contrib., p. 105.

Near *U. saxosa* (Poey), but the lower lamella continues to the lip, producing a notch at the base of the columella. Figured from topotypes.

Section *Gongylostoma* Albers, 1850.

Gongylostoma Alb., Die Heliceen, p. 208, for *C. sowerbyana, humboldtiana, rosea, variegata, elegans, crispula, sagraiana* and *philippiana* of Pfr., and *porrecta* Gld.—Martens, Die Hel., 1860, p. 38, *C. elegans* selected as type.—Pils. & Van., Proc. A. N. S. Phila. 1898, pp. 269, 271, 276.

Urocoptis with one or two spiral lamellæ, the lower one denticulate, at least in the upper whorls; sometimes a short smaller lamella between the two. Shell unicolored, corneous or brownish, or with paler riblets on a corneous ground. Type *U. elegans* (Pfr.).

The dentition (pl. 60, fig. 8, *U. elegans auberiana*) is similar to that of most other West Cuban Cylindrellas, the central teeth being wide, the laterals having large ectocones. They decrease in size rather rapidly, nearly half the teeth of each row being shortened and oblique; and they are less crowded than in *Liocallonia*. *Callonia* has similar teeth, but the number is reduced, and the cusps are narrower. Whether these small differences between the teeth of the sections of *Gongylostoma* will prove constant when more species are examined remains to be seen.

This is the most difficult group of Cuban *Urocoptis,* not only because many of the species are very similar, but on account of the numerous unfigured and not fully described forms introduced by Arango. The key given below is to be regarded as a first attempt.

There is a regular and uninterrupted gradation in axial structure from the two strong lamellæ of the group of *U. elegans* and *U. crispula,* to the single weak spiral thread of the group of *U. capillacea.*

In the group of *U. elegans* there is often a short third lamella interposed between the other two. The upper lamella is noticeably thicker than the lower one. In some of the other groups the upper lamella also is thin.

Key to Species of Gongylostoma s. str.

I. Shell ribbed; uniform or with light ribs on a darker ground; two axial lamellæ (group of *U. crispula*).
  1. Sinistral. *U. coronadoi,* no. 88.
  2. Dextral.
    a. Two axial lamellæ subequal, both stout. *U. crispula,* no. 87.
    b. Upper lamella decidedly thicker than lower. *U. artemisiæ,* no. 84.
    c. Lamellæ subequal, both thin. *U. gutierrezi,* no. 85; *U. lirata,* no. 86.
  3. Dextral, small with only one well-developed axial lamella.
    a. Rapidly tapering above; 12 to 15 x 3 mm., with 12-15 whorls. *U. fusiformis,* no. 104.
    b. Length 10 to 12, diam. about 3 mm., with 8½ to 9 whorls. *U. garciana,* no. 108.

II. Shell striate, the axis with two or three strong lamellæ.
  1. Striæ coarse but low, sometimes effaced on the convexity of each whorl.
    a. Small, about 11 x 3 mm., with 9½-11 whorls; upper lamella obsolete above the last 4 whorls. *U. distincta,* no. 98.

b. 10 x 2.75 mm., with 10 whorls.
U. difficultosa, no. 96.

c. Larger, 13-21 x 3.5-4.5 mm., whorls 9-12.
U. l. trinidadensis, no. 97.

d. Larger, 17.5 x 4 mm., whorls 13; whitish, base carinate. *U. prima,* no. 92.

2. Striæ rather fine, subobsolete on the convexity of each whorl; axis slender, the upper lamella small, not extending into the last two whorls.
U. cristallina, no. 100.

3. Densely striate, 16 x 4 mm., with 13 whorls; upper lamella stronger. *U. confusa,* no. 93.

4. Very densely, sharply and finely striate, 13 x 3.2 mm. with 12, to 16.5 x 3.4 mm. with 14½ whorls; axis stout, with two strong lamellæ.
U. fortis, no. 95.

5. Very finely, subeffaced striate, *glossy,* the whorls nearly flat; 12-15.5 mm. long, 2.7-3 diam., whorls 10-13; upper axial lam. stout, rounded, the lower compressed, less wide. *U. planospira,* no. 94.

6. Smooth, the last whorl striate; suture crenulate; 21 x 4 mm., 12 whorls; interior unknown.
U. lavalleana, no. 97.

7. Finely striate, the lower axial lamella slightly more widely projecting than the upper.
U. hilleiana, no. 91; *U. e. subelegans,* no. 90 b.

8. Finely striate, the upper axial lamella slightly predominating over the lower, a median one often developed.

a. Cylindric, with 10½-16 whorls.
U. elegans, no. 90; *U. arangiana,* no. 89.

b. Fusiform, 10-12 whorls.
U. e. auberiana, no. 90 a.

III. Small, striate or with spaced riblets, two weak lamellæ encircling the axis (group of *U. angustior*).

1. Shell truncate when mature.

a. Sculptured with strong, narrow riblets; 12½ x 3 mm., whorls 12. *U. fusiformis,* no. 104.

b. Finely striate; whorls 14-15, 11-12 x 2.5 mm. *U. fraterna,* no. 101.

c. Striate; whorls 10-11.

aa. Striation coarse and low or subobsolete; upper lamella obsolete in upper half of shell; 10-12 x 3-3.3 mm. *U. distincta,* no. 98.

bb. Opaque, carinate below; 10 x 2.75 mm. *U. consanguinea,* no. 99.

cc. Smooth on convexity of whorls, elsewhere regularly striate; 10-12 x 2.3-2.7 mm. *U. cristallina,* no. 100.

dd. Densely hair-striate; 15 x 3.3 mm.; like *U. fortis* in shape and sculpture. *U. fumosa,* no. 102.

2. Spire entire, not truncate.

a. Ribbed; 15.5 x 3 mm.; whorls 14½. *U. fusiformis,* no. 104.

b. With wide-spaced, thread-like striæ, stronger near the sutures; 13-16 x 2.6 to 3 mm.; whorls 15 to 17. *U. integra,* no. 105.

c. Finely striate; neck descending; 13 to 17 x 2.5 mm., whorls 17-19. *U. angustior,* no. 103.

d. Closely, obsoletely striate, whitish; 16 x 2.25 mm., whorls 17. *U. imparata,* no. 106.

IV. Small, slender species, with a single spiral axial thread or lamella (group of *U. capillacea*).

1. Sculpture of wide-spaced thread-like riblets. *U. remota,* no. 109; *U. garciana,* no. 108; *U. fusiformis,* no. 104; *U. crassilabris,* no. 114.

2. Closely striate or nearly smooth.

a. Apex entire; very closely and very finely striate; 10 to 12 x 2.5 mm., whorls 13-14. *U. capillacea,* no. 112.

b. Truncate; like *U. elegans,* but axis encircled by a thick thread. *U. moralesi,* no. 110.

c. Truncate; delicately, closely striate, glossy; 12 x 3 mm., whorls 10-11.
U. machoi, no. 107.

d. Truncate; weakly striate or nearly smooth, whitish hyaline; 12 x 2.6 mm., whorls 11.
U. concreta, no. 111.

e. Slightly truncate, cylindric-subulate, smooth, pellucid whitish; 15 x 3 mm., whorls 19.
U. volubilis, no. 113.

(*Group of U. crispula.*)

84. U. ARTEMISIÆ ('Gundl.' Pfr.). Pl. 54, figs. 67, 68, 69, 70.

Shell rimate, fusiform-turreted, rather solid, obliquely somewhat closely rib-striate, hardly shining, flesh-colored; spire a little swollen in the middle, noticeably tapering above, truncate. Whorls remaining 11, a little convex, the last cylindrical, shortly free in front and somewhat descending, slightly dilated and more closely costulate. Aperture nearly diagonal, subcircular; peristome equally, narrowly expanded. Internal column encircled by two strong, subequal laminæ. Length 12-12½, diam 3½ mm.; apert. diam. ⅓ mm. (*Pfr.*).

Western Cuba: Town of Artemisa (Gundlach); Marianao (Arango, Rhoads), both westward from Havana.

Cyl. artemisiæ Gundlach mss., PFR., Malak. Bl., xi, 1863, p. 6; Monogr., vi, p. 380.—ARANGO, Contrib., p. 121.—*C. artemesiæ* SOWERBY, Conch. Icon., xx, pl. 12, f. 106.

The shape, somewhat swollen in the middle, is characteristic. The color of Artemisa specimens is pale brownish flesh color, the riblets lighter, but owing to the adhesion of a coat of soil, museum specimens commonly are brick-red, like Sowerby's figure, which I have copied (pl. 54, fig. 69). These shells retain 9½ to 13½ whorls, but in the latter case several upper ones have been abandoned, 10 to 11 being the ordinary number. The riblets are well raised, thread-like and oblique, only slightly arcuate, and separated by spaces of about three times their width. There are about

four riblets in the space of a millimeter. On the back of the neck they become more crowded, and of course still more so on its front. The axis is rather wide below, and in the penult. and three preceding whorls it bears two equally prominent lamellæ, both rather stout, with the edge rounded, but the upper cord is the heavier. In still earlier whorls the upper cord disappears abruptly, and the lower is narrower and minutely denticulate at the edge.

Length 14, diam. 3.4 mm.; whorls 11.

Length 11.5, diam. 3.3 mm.; whorls 9½.

The specimens from Marianao (pl. 54, fig. 70) are larger than the above, longer, often more strictly cylindric. They are like those from the type locality internally, except that the upper lamella persists somewhat further upward.

Length 17, diam. 3.3 mm.; whorls 12½.

Length 14, diam. 3.4 mm.; whorls 11½.

Length 12.5, diam. 3 mm.; whorls 10⅓.

They occur there with *U.* (*Cochlodinella*) *pocyana* var. *variegata,* a more finely striate species but of about the same size.

85. U. GUTIERREZI (Arango). Pl. 54, figs. 72, 72, 73.

"Very closely related to *artemisiæ*, but the shape is more cylindrical, and the internal column is bilamellate (as in *artemisiæ*), but the laminæ are compressed and weak (in *artemisiæ* they are strong)." (*Arango.*)

Western Cuba: Isabel Maria, in Pinar del Rio (Wright).

Cyl. gutierrezi AR., Anales de la Real Academia de Ciencias medicas, fisicas y naturales de la Habana, xii, p. 283, no. 9 (Feb. 15, 1876); Contrib., p. 121.

This species has a cylindrical, truncate shell, the upper third or more frequently the fourth slowing tapering. It is flesh colored and sculptured with whitish thread-like riblets separated by intervals fully three times their width; on the very short neck they are generally not more crowded. The aperture is but slightly oblique, brown inside, nearly circular, but the columellar margin is perceptibly less arcu-

ate than the outer lip. The white peristome is reflexed. The axis bears two slender, compresssed, subequal lamellæ. It is like the Marianao form of *U. artemisiæ* in shape, color and sculpture, but differs in the slender axial lamellæ, while in *artemisiæ* the upper one is stout and cord-like. *U. gutierrezi,* named for the founder of the Royal Academy of Medical, Physical and Natural Sciences of Havana, was discovered by Charles Wright, and distributed by him as *Cyl.* no. 370.

Length 14.3, diam. 3 mm.; whorls 11⅓.

Length 11.3, diam. 2.9 mm.; whorls 10.

86. U. LIRATA ('Jimeno' Pfr.).

Shell fusiform-cylindric, rather solid, sculptured with nearly straight, close, cord-like ribs, rufous-corneous. Spire somewhat swollen, rather widely truncate; suture crenulated by the projection of the ends of the riblets. Whorls remaining 10, a trifle convex, the last tapering, horizontally produced, more closely costulate anteriorly. Aperture oblique, depressed-circular; peristome white, subequally expanded throughout. Internal column with two compressed, obliquely revolving lamellæ, the upper one stronger. Length 13, diam. 4⅓ mm., aperture nearly 3 mm. high, a little wider (*Pfr.*).

Western Cuba: Near the city of Matanzas (Don Francisco Jimeno).

Cyl. lirata Jimeno mss., PFR., Malak. Bl., xi, p. 12; Monogr., vi, p. 378.—ARANGO, Contrib., p. 119.

Unknown to me. Pfeiffer states that it stands nearest to *U. crispula,* which also has two parallel lamellæ upon the internal column; but in *crispula* they are equal, less acute, and more obliquely ascending. Moreover, *lirata* is more swollen, with straighter ribs; the neck longer and projects horizontally forward. Arango queries the locality Matanzas, but from the characters of the shell, it would be expected to occur in that part of Cuba.

87. U. CRISPULA (Pfeiffer). Pl. 54, fig. 77.

"Shell truncate, subcylindric, more swollen above the mid-

dle, thin, pale corneous, crispate-ribbed with waved folds. Whorls 12-13, convex, the last tapering, free, a little produced. Aperture orbicular; peristome expanded and a little reflexed throughout. Length 15, diam. 4, diam. of aperture 3 mm." (*Pfr.*).

Western Cuba: A wood on a coffee plantation between Buena Vista and El Fundator, near the latter place, on the river Canimar, prov. Matanzas (Pfr.).

Clausilia crispula PFR., Wiegm. Archiv für Naturgeschichte 1839, i, p. 353.—*Cyl. crispula* PFR., *l. c.* 1840, i, p. 42; Phil., Abbild., i. p. 181, pl. 1, f. 13; Monogr., ii, p. 377; Conchyl. Cab., p. 27, pl. 4, f. 1-3.—ARANGO, Contrib., p. 119.—SOWERBY, C. Icon., pl. 5, f. 39.—*Pupa crispula* GLD., Journ. Boston Soc. N. H., iv, p. 492.

This shell is nearly white, and usually a trifle wider above the middle than below. The slightly crimped riblets, though narrow and compressed, hardly more than a fourth the width of the intervals, are generally at least in part *hollow*, a few broken down on the spire usually showing this structure. The neck is short, and the internal column like that figured for *U. artemisiæ*. Pfeiffer's type was an unusually large example, most specimens measuring less, length 13, diam. 3.2 mm.; whorls 11.

88. U. CORONADOI ('Arango' Pfr.). Pl. 54, fig. 71.

Shell *sinistral*, subcylindric or moderately swollen in the middle; lustreless, corneous or flesh-tinted, sculptured with narrow, oblique hardly arcuate riblets, separated by wide intervals; whorls convex, the last shortly free. Aperture circular, somewhat oblique, the peristome whitish, slightly expanded. Internal column encircled by two lamellæ, the lower compressed, minutely denticulate in the earlier whorls, the upper lamella low and rounded, cord-like.

Length 12, diam. 3.3 mm.; whorls 10.

Length 11.5, diam. 2.8 mm.; whorls 10.

Length 13.5, diam. 3 mm.; whorls 10-11 (Pfr., types).

Western Cuba: Puentes Grandes, type locality; Chorrera (Arango); Carmelo (S. N. Rhoads), all near Havana.

Cyl. coronadoi Arango, Pfr., Malak. Bl., xi, p. 13; Monogr., vi, p. 378; Novit. Conch., p. 251, pl. 63, f. 26-29.—Sowerby, C. Icon., xx, pl. 12, f. 108.—Arango, Contrib., p. 119.—*? C. corona* Schauf., Paetel, Cat., p. 68.

Near *U. crispula,* but constantly sinistral, with the peristome narrower, but slightly expanded, and the upper axial lamella is smaller, reduced to a rounded cord, more obliquely coiled than the lower lamella. The young shell is attenuated near the apex, then increases more rapidly. The first two whorls are smooth, and apparently about 9 are rejected in the adult state. Named for Don Francisco Javier Coronado, a conchologist and physician of Havana.

(*Group of U. elegans.*)

89. U. arangiana ('Gundl.' Arango).

Like *Cyl. elegans,* but differing in the greater number of whorls in specimens of equal length; in the more cylindric shape of the shell, the whorls less convex. Fourteen whorls remain. It especially differs from *elegans* in that the internal column has two stronger, thicker, subequal lamellæ in all the whorls, the upper one a little wider (Gundlach).

Western Cuba: Canasi, near Matanzas (Arango).

Cyl. arangiana Gundl. mss., Arango, Contrib., p. 113 (1878). Known to me by the original description, translated above. It must be very similar to the typical *U. elegans.*

90. U. elegans (Pfeiffer). Pl. 53, figs. 41-45, 66.

"Shell decollate, cylindric, the truncate apex slightly attenuate; glossy, hyaline, reddish or brown near the apex; very obliquely and closely, elegantly striate. Whorls 16, convex, subequal, the last narrowed, protracted, subcylindrical. Aperture circular, the peristome simple, expanded throughout. Length 19, diam. 4 mm.; apert. with perist. 3¼ mm. diam." (*Pfr.*).

Western Cuba: Very abundant around Matanzas, especially on the banks of the Canimar river, at El Fundator (*Pfr.*). Ferinicea (Wright).

Clausilia elegans Pfr., Archiv f. Naturg., 1839, i, p. 353.—

Cylindrella elegans Pfr., l. c., 1840, i, p. 42; Phil., Abbild., i, p. 180, pl. 1, f. 12; Monogr., ii, p. 374; iii, 572; iv, 701; vi, 371; viii, 434; Conchyl. Cab., p. 23, pl. 3, f. 3-5 (typical; 6-11 var.).—Desh., in Fer., Hist., p. 228, pl. 164, f. 26-28.—A. Schmidt, Der Geschlechtsapparat der Stylommatophoren in taxonomischer Hinsicht, Abh. Nat. Ver. Sachsen u. Thur. in Halle, p. 50, pl. 14, f. 110 (genitalia).—W. G. Binney, Proc. A. N. S. Phila. 1875, p. 251, pl. 20, f. 6, and Ann. N. Y. Acad. Sci., iii, p. 126, pl. 14, f. B (dentition).—Arango, Contrib., p. 113.—*Pupa elegans* Pfr., Gld., Bost. Journ. N. H., iv, p. 490.—*Pupa* (*Siphonostoma*) *lituus* Gld., Bost. Journ., iv, pt. 1, on cover.—*Cyl. nobilis* Stentz mss., teste Villa.—*Pupa obtorta* Mke., in litt., teste Pfr.—*Balea truncatula* Villa Disposit. Syst., p. 25, teste Pfr.; no descr. (1841).

The typical form of U. elegans (pl. 53, figs. 41-45, 66) is a *long, pillar-shaped, whitish-corneous* shell, with the *strongly tapering* upper third or fourth of the length of a *brown or reddish tint,* or sometimes pale yellowish. It is often a little wider at the upper third, or the lower two-thirds may be cylindrical. The truncation is narrow. The whorls are distinctly convex, numerous, 13 to 17 in normal truncate specimens, and 22 to 24 in those retaining the apex in maturity, according to Pfeiffer, who found several. The last whorl becomes free, tangential and slightly descending, and is usually a little flattened at the top of the neck. The striæ are arcuate and regular, slightly narrower and sharper on the neck. The longest axis of the aperture is obliquely transverse; it is slightly ovate, the columellar side being less arcuate and wider. The axis bears two spiral lamellæ, both becoming obsolete in the last whorl, about equal in the preceding two whorls, while in several still earlier whorls the upper lamella predominates, and there may be a weak median cord developed. The lower lamella is finely more or less denticulate, and in one or two median whorls it usually is shallowly grooved along the summit, with a narrow denticulate thread in the furrow.

Length 19.5, diam. 3.6 mm.; whorls 17½ (but plug at 13½ whorls).

Length 18, diam. 3.8 mm.; whorls 13½.
Length 18, diam. 3.5 mm.; whorls 14½.
Length 16, diam. 3.8 mm.; whorls 12½.
Length 12.5, diam. 3.3 mm.; whorls 10½.
} Ferinicea.

Figs. 41, 42 represent typical specimens received from Poey many years ago, probably from the original locality. Figs. 43, 44, 45 are copies of Pfeiffer's original figures. Fig. 66 is the pillar of a specimen of the same form from Ferinicea. The chief variation, aside from the usual mutability in size noted in the measurements given above, is in the internal pillar, which occasionally has a minor median cord, such as I have drawn in fig. 64 of pl. 53, or even approaching the structure shown in fig. 52. There is also a form with a narrow brown band bordering the suture below (fig. 46). In this form the upper lamella is the larger in the median whorls, and there is a low intermediate cord, as in some specimens of typical *elegans*. It was found by Gundlach on the plantation "Union," where also the brown-sutured *U. caecilia* occurred. (Cf. Pfr., Conchyl. Cab., p. 24, var. no. 4.)

90 a. Var. *auberiana* (Orbigny). Pl. 53, figs. 56, 57, 51, 52, 53.

Somewhat broader, and usually more swollen in the middle, shells of the same length being more or less fusiform, wider than in *U. elegans*, and with fewer whorls; corneous or brownish-corneous. Neck usually a little shorter. Axis with the upper lamella perceptibly larger than the lower, and usually a smaller lamella revolves between them.

Length 18, diam. 4 mm.; whorls 12.
Length 15.5, diam. 4 mm.; whorls 10.
Length 13, diam. 3.6 mm.; whorls 10.
Length 13, diam. 3.5 mm.; whorls 10 (Orbigny's type).

Pupa auberiana Orb., in de la Sagra's Hist. Cuba, Moll., i, p. 184, pl. 12, f. 21-23.—Pfr., Monogr., ii, p. 376.—*Cyl. elegans* Sowerby, C. Icon., xx, pl. 4, f. 30.

Orbigny's specimens of *auberiana* were supplied by Poey, and some received from the same naturalist under that name are in the collection of the Academy.

90 b. Var. *subelegans* Pilsbry, n. v. Pl. 53, figs. 47, 48, 49, 50.

Shell deeply rimate, subcylindric, a little swollen in the middle, tapering above; pale corneous, very glossy, very finely arcuate-striate, the striæ lower and finer than in *U. elegans* or *auberiana*. Whorls rather convex, the last shortly free, very densely and more sharply striate on the neck. Aperture nearly round, the lip white, expanded, not reflexed as in *U. elegans*. Axis with two lamellæ, the lower one widest.

Length 20, diam. 4.4 mm.; whorls 12⅓.

Length 16.5, diam. 4 mm.; whorls 10.

Length 12.5, diam. 3.3 mm.; whorls 10¾.

Western Cuba: Artemisa, Pinar del Rio (Chas. Wright); La Salud (R. Arango).

Urocoptis elegans variety, Pils. & Van., Proc. A. N. S. Phila. 1898, p. 276, pl. 18, f. 17.

Similar to *auberiana*, but more finely striate, and with the lower axial lamella larger instead of the upper, although in many specimens the disparity is less marked than in that figured. The lip is far narrower than in *U. elegans*. Cf. *U. hilleiana*.

91. U. HILLEIANA ('Gundl.' Arango).

Shell cylindric-turrete, truncate, rather solid, obliquely, very finely striate, opaque, brownish-ashen. Whorls 13-14 remaining, convex, somewhat contabulate, the last free. Peristome expanded a little, whitish. Suture deep, simple. Aperture subcircular. Length 14, diam. 3½ mm. Internal column encircled by two thick lamellæ, the anterior one wider. (*Arango*).

Western Cuba: Madruga, province of Habana (Gundlach).

Cyl. hilleiana Gundl. mss., Arango, An. Real Acad. Cien., etc., de Habana, xii, p. 282, no. 8 (1876).

Dedicated to Dr. Luis Hille, of Marburg, Germany.

92. U. PRIMA (Arango).

Shell rimate, cylindric-turrete, rather solid, somewhat closely, obsoletely ribbed, whitish; spire noticeably tapering

above the middle, truncated in the single specimen known; suture crenulate; remaining whorls 13, rather flattened, the last carinate at the base, shortly free in front. Aperture oblique, subcircular; peristome shortly expanded, subsinuate anteriorly at the keel. Internal column ornamented with two descending folds. Length 17.5, diam 4 mm. (*Arango*).

Cuba.

Cyl. prima ARANGO, Proc. A. N. S. Phila. 1882, p. 107 (June 27, 1882).

93. U. CONFUSA (Arango).

Shell rimate, cylindric turrete, solid, closely striate, whitish; spire noticeably tapering above the middle, shortly truncate; suture not crenulate; whorls remaining 13, rather flat, the last carinate at the base, shortly free in front. Aperture subcircular, the peristome narrowly expanded. Internal column provided with two strong, slowly descending lamellæ, the upper one stronger. Length 16, diam 4 mm. (*Arango*).

Cuba.

Cyl. confusa ARANGO, Proc. A. N. S. Phila. 1882, p. 107.

94. U. PLANOSPIRA (Pfeiffer). Pl. 53, figs. 61, 62, 60.

Shell cylindric, slowly tapering to a wide truncation above, thin, pale corneous; surface *glossy,* very densely and finely sculptured with close, nearly straight, low striæ, becoming rather coarse and sharp on the last half whorl. *Whorls but slightly convex, almost flat,* the last free in front, the neck a little contracted and rounded. Aperture rounded, the lip expanded, reflexed and thickened. Axis bilamellate, the upper lamella stout and rounded, more prominent than the lower, which is compressed and slightly serrate.

Length 15, diam. 3 mm.; whorls 12.

Length 12.3, diam. 2.7 mm.; whorls 10.

Length 15.5, diam. 3 mm.; whorls 13 (Pfr., type).

Western Cuba: Managua, 15 miles S. by E. of Havana (Poey).

Cyl. planospira PFR., Malak. Bl., ii, 1855, p. 99, pl. 5, f. 4, 5; Conchyl. Cab., p. 24, pl. 3, f. 12-14; Monogr., iv, 701; vi, 371;

Malak. Bl., xi, p. 9.—Arango, Contrib., p. 114.—Sowb., C. Icon., xx, pl. 16, f. 137.—*Cyl. subita* Poey, Memorias, ii, pp. 32, 61, pl. 3, f. 12, 13.—Pfr., Malak. Bl., iii, p. 222; Monogr., iv, p. 692.—*Cyl. concinna* Arango, according to Pfr.

Well distinguished by its almost flat whorls, glossy surface, with very fine, almost effaced striation, but becoming sharply costulate on the neck. Arango gives the locality Sitio Perdido, in Jaruco, where Clerch collected it, and Bejucal; but the specimens he sent as *planospira* from the latter place are a form of *U. elegans*. In Malak. Bl., xi, Pfeiffer states that Arango collected *planospira* at the mountain Cuzco, near Cayajabos; but in the *Contribucion* no mention is made of this locality for the species. Fig. 60 is from that of Pfeiffer.

95. U. fortis ('Gundl.' Pfr.). Pl. 53, figs. 54, 55, 59.

Shell cylindric, the upper third or fourth tapering to the wide truncation; pale corneous, somewhat glossy when clean, but normally dull and soiled; the *surface very closely, sharply striated, the striæ thread-like,* becoming a trifle more spaced on the neck. Whorls narrow, slightly convex, the last shortly free, rounded. Aperture rounded, oblique, the peristome expanded and a little reflexed. *Axis very stout,* fusiform, with two strong spiral lamellæ, the upper one heavier and somewhat larger in the intermediate whorls, the lower lamella delicately spinose in the upper whorls.

Length 16.5, diam. 3.4 mm.; whorls 14½.

Length 14.8, diam. 3.7 mm.; whorls 11½.

Length 13, diam. 3.2 mm.; whorls 12.

Length 16, diam. 3.66 mm.; whorls 13-14½ (Pfr., type).

Western Cuba: Ceiba Mocha, near Matanzas (Gundlach, Arango, Wright).

Cyl. fortis Gundlach mss., Pfr., Malak. Bl., xi, 1863, p. 5; Monogr., vi, p. 375.—Arango, Contrib., p. 117.

Distinct by its very fine, dense, sharp striation, short whorls, and the stoutness of the strongly bilamellate internal axis. The external sculpture reminds one of the Jamaican *U. hydrophana*. The rosy tint noticed by Pfeiffer is due to adhering soil.

96. U. DIFFICULTOSA (Arango).

Shell rimate, cylindric-turrete, rather solid, glossy, obsoletely costulate, pale straw-colored; spire shortly truncate, the suture not crenulate. Whorls remaining 10, rather flat, the last subcarinate at the base, not protracted. Aperture oval, the peristome shortly expanded, the left margin less so. Internal column ornamented with two strong folds. Length 11, diam. 2.75 mm. (*Arango*).

Cuba.

Cyl. difficultosa ARANGO, Proc. A. N. S. Phila. 1882, p. 107. —*Cyl. difficilis* CROSSE, Journal de Conchyl., 1890, p. 218 (emendation of *difficultosa*).

Differs from *C. concreta* by the riblets, non-solute last whorl, and form of the internal column (*Arango*).

97. U. LAVALLEANA (Orbigny). Pl. 54, figs. 85, 86.

Shell much lengthened, subcylindric, thin, fragile, transparent, very smooth. Spire very much lengthened, cylindric anteriorly, attenuate behind, and truncate at the summit, which is acute in the young; composed of 12 quite narrow, convex whorls; the last whorl produced laterally near the mouth, longitudinally striate, carinate beneath. Whorls separated by a rather deep suture, which is regularly crenulate. Aperture free, lateral, oval, oblique, with thin, slightly reflexed, continuous peristome. Color uniform light brown. Length 21, diam. 4 mm. (*Orb.*).

Western Cuba: Cerro de Cuzco (MM. Auber and Delatre). Central Cuba: Sitio Quemado and Guinia de Miranda, district of Trinidad, prov. Santa Clara (Gundlach).

Pupa lavalleana ORB., in Sagra, Hist. Cuba, Moll., i, p. 183, pl. 12, f. 18-20.—*Cyl. lavalleana* Orb., PFR., Monogr., ii, p. 372; iv, 693; vi, 362; Conchyl. Cab., p. 17, pl. 9, f. 18-25.—ARANGO, Contrib., p. 106.—*?Cyl. lavalliana* SOWB., C. Icon., pl. 7, f. 56.

The original description is given, and the original figures are copied, pl. 54, figs. 85, 86. The locality given by Orbigny, "Cerro de Cuzco," is apparently the mountain of that name near Cayajabos, in Pinar del Rio. The internal structure of this form is unknown.

Var. *trinidadensis* Pils., n. v. Pl. 54, figs. 83, 84, 87.

The specimens before me from the interior of Trinidad, central Cuba, where Gundlach collected, are what Poey, Arango and Pfeiffer (Malak. Bl., iv, p. 110) have identified as *lavalleana,* but they seem to differ from the original description in sculpture, being either rather coarsely rib-striate throughout, or with the striæ partially effaced on the convexity of each whorl, instead of being "very smooth," as Orbigny states. The axis (pl. 54, fig. 87) is slender, encircled by two lamellæ, the upper one cord-like, rather heavy, the lower lamella thinner, broader, finely serrate at the edge, persisting in the penult. whorl, where the upper lamella is obsolete. The shell is drawn out in a very long, slender point in the young, according to Pfeiffer. The size varies within wide limits.

Length 21, diam. 4.5 mm.; whorls 12.

Length 17, diam. 4 mm.; whorls 11.

Length 13, diam. 3.5 mm.; whorls 9.

Pfeiffer seems to have examined the type of *lavalleana* in the British Museum. This variety is one of the easternmost species of its kind; but central Cuba has apparently been very imperfectly explored for land shells.

Group of U. angustior.

Shell small. Axial lamellæ two, decidedly weaker than in the preceding group. Sometimes a short, low third cord is interpolated.

98. U. DISTINCTA ('Gundl.' Arango). Pl. 53, figs. 58, 63, 65; pl. 55, figs. 2, 9, 10, 11.

Shell pale brownish-corneous, slightly swollen in the middle, coarsely striate, but the striæ are low and rounded, stronger on the early whorls, and on the base and neck of the last whorl they become elevated and thread-like. Sometimes the striæ are subobsolete on the cylindrical portion of the shell, except near the sutures. The internal pillar has two spiral lamellæ in the penultimate and preceding two whorls, the lower lamella moderately strong, with rounded

edge, the upper lamella lower, but slightly stouter, cord-like. The upper lamella diminishes upwards, hardly appearing in the upper half of the shell, where the axis is straight, encircled by a single compressed, denticulate lamella.

Length 12.6, diam. 3.3 mm.; whorls 10½.

Length 12, diam. 2.9 mm.; whorls 11.

Length 10.8, diam. 3 mm.; whorls 9½.

Western Cuba: Punta de la Jaula (type locality) and Sitio Nuevo, Guane (Wright).

Cylindrella concreta Gundl., Pfr., Novit. Conch., pl. 97, f. 12-15, but not the description.—*Cyl. distincta* Gundl. mss., Arango, An. Real Acad. Cien., etc., de la Habana, xii, p. 284, no. 13 (1876).

Formerly confused with *U. concreta,* which is almost exactly similar in external characters. Pfeiffer figured a specimen of *distincta* for *concreta* in the *Novitates Conchologicae.* Probably Sowerby's figure of *concreta* is referable rather to the present species.

99. U. consanguinea (Arango).

Differs from the preceding [*difficultosa*] by the opaque shell, last whorl carinate at the base, and internal column provided with two weaker descending laminæ. The number of whorls and length of the shell are as in the preceding species (*Arango*).

Cuba.

Cyl. consanguinea Arango, Proc. A. N. S. Phila. 1882, p. 107.

100. U. cristallina ('Wright,' Pfr.). Pl. 54, figs. 80, 81, 82.

Shell subrimate, cylindric below, the upper half or third tapering to a rather wide truncation; thin; transparent whitish. Surface very glossy, *smooth or nearly so on the median convexity* of each of the whorls of the cylindrical portion of the shell, *elsewhere regularly striate,* the sutures finely crenulated by the striæ; base and neck of the last whorl striate. Whorls convex, the last shortly free in front. Aperture round-oval, oblique, the peristome very narrowly

reflexed. Axis slender, encircled by a low spiral lamella, which in the upper whorls is distantly denticulate, and a smaller lamella above it, extending downward only into the third whorl from the base. The two lamellæ are of about equal size in the whorls of the upper half of the shell.

Length 10.3, diam. 2.3 mm.; whorls 10 to 11.

Length 12, diam. 2.75 mm.; whorls 11 (Pfr., type).

Western Cuba: La Palma, Pinar del Rio (Wright).

Cyl. cristallina Wright mss., Pfr., Malak. Bl., xii, 1865, p. 120; Monogr., vi, p. 363; Novit. Conch., p. 437, pl. 97, f. 22-25.—Arango, Contrib., p. 108.—Crosse, J. de C., 1890, p. 219.

Not unlike *U. distincta,* but the axis is weaker, the lower lamella small, and the upper lamella is obsolete in the lower whorls, nowhere conspicuous, so that Pfeiffer describes the column as "subsimplex, vix torta;" and indeed it escaped notice by Mr. Vanatta and myself in our paper of 1898 (p. 277). Figures 81, 82 are from specimens received from Wright, fig. 80 from Pfeiffer.

101. U. FRATERNA n. sp. Pl. 55, figs. 1, 6.

Like *U. capillacea* in shape and color, but *more coarsely striate,* and the axis bears *two* spiral lamellæ. Whorls 14½ to 15, the spire complete.

Length 12, diam. 2.5 mm.

Length 11, diam. 2.3 mm.

Western Cuba: Isabel Maria, in dist. of Pinar del Rio, prov. P. del R. (Chas. Wright, no. 382).

A very closely related form, probably identical, occurs at los Cayos de San Filipe, in the district of Vinales, prov. Pinar del Rio, where Wright collected specimens before me.

102. U. FUMOSA ('Gundl.' Pfr.).

Shell subrimate, cylindric-turrete, rather solid, very densely, obliquely hair-striate, silky, corneous-brown; spire lengthened, a little swollen in the middle, the apex truncate. Whorls remaining 11, a little convex, the last free, subsulcate on the left side. Aperture a little oblique, circular; peri-

stome white, equally reflexed all around. Internal column encircled by two thread-like, but slightly projecting folds. Length 15, diam. 3.33 mm.; aperture diam. 2.5 mm. (*Pfr.*).

Western Cuba: Plantation Caunabaco, at the foot of El Palenque, a hill in the western part of prov. Matanzas, under stones. (Gundlach).

Cyl. fumosa Gundl. mss., Pfr., Malak. Bl., xi, 1863, p. 5; Monogr., vi, p. 375.—Arango, Contrib., p. 118.

Near *U. fortis* in shape and sculpture, but very different in internal structure. I have not seen specimens.

103. U. angustior ('Wright' Pfr.). Pl. 59, figs. 79, 80, 81.

Shell very slenderly subfusiform, the last three normal whorls of about equal diameter, those above tapering in a *much attenuated, usually entire spire* to the globose, smooth apex; thin, corneous, somewhat transparent, brown above. Surface glossy, *finely and regularly striate,* the striæ as wide as the intervals. Whorls convex, the last free, the free portion straight, produced downward and forward. Aperture oblique, subcircular, the lip continuous, expanded and somewhat reflexed. Axis slender, encircled by two delicate lamellæ, the lower one weakly denticulate, the upper lamella smaller, obsolete in the later whorls.

Length 15.5, diam. 2.5 mm.; whorls 19½ } Cayos de
Length 13, diam. 2.4 mm.; whorls 17. } S. Filipe.
Length 14, diam. 2.33 mm.; whorls 18-19 (Pfr., type).
Length 17.5, diam. 2.5 mm.; whorls 18½ (El Guania).

Western Cuba: Cayos de San Filipe, district of Vinales, Pinar del Rio (Wright); El Guania, Pinar del Rio (Arango).

Cyl. angustior Wright mss., Pfr., Malak. Bl., xi, 1864, p. 130; Monogr., vi, 384.—Arango, Contrib., p. 124.—Not of Sowerby, C. Icon., xx, pl. 11, f. 97.

Allied to *U. capillacea, distincta,* etc., but more slender, retaining all or most of the spire, which is strongly attenuate above. In some specimens the upper axial lamella is almost or quite obsolete. Mr. Sowerby has figured some other species for this one, but it is quite impossible to tell what.

104. U. FUSIFORMIS ('Wright' Pfr.). Pl. 59, figs. 75, 76, 82.

Shell subcylindric below, the upper half tapering to a narrow truncation or an obtuse, entire apex, thin, whitish corneous. Surface lustreless, sculptured with *strong narrow ribs,* which are parted by spaces of three or four times their width. Whorls convex, the last shortly free, slightly descending. Aperture circular, the peristome reflexed throughout. Axis with a single delicate, acute lamella near the base in each whorl, denticulate at the edge, and either nearly simple above it, or encircled by one or two weak, low and inconspicuous spiral cords.

Length 12.5, diam. 2.9 mm.; whorls 14½ (apex entire).

Length 15.5, diam. 3 mm.; whorls 12 (Pfr., type; truncate).

Western Cuba: San Diego de los Banos, Pinar del Rio (Wright); Guladon a Carquanabo (Wright).

Cyl. fusiformis Wright mss., PFR., Malak. Bl., xi, 1863, p. 12; Monogr., vi, p. 380.—ARANGO, Contrib., p. 120. Not *Pupa fusiformis* C. B. Ad., 1845, a var. of *Anoma maugeri.*

The spaced riblets remind one of the *U. crispula* group, but the delicate axial sculpture is widely unlike that group.

105. U. INTEGRA (Pfeiffer). Pl. 59, figs. 71, 72, 73, 74.

Shell fusiform, much attenuated above, *the apex entire;* pale brown. Surface somewhat dull, sculptured with rather widely spaced, *thread-like riblets, which are stronger and whitish near the sutures,* weak or obsolete on the convexity of each whorl, usually continuous on the last whorl. Whorls convex, the last free, descending and produced forward, the neck acutely costulate. Aperture oblique, circular, brownish within; peristome continuous, expanded and reflexed. Axis slender, trilamellate, the lower lamella largest, minutely denticulate above, extending weakly in the last whorl; median lamella well developed in the third and fourth whorls upward, weak or hardly entering the last whorl. Upper lamella low and small, sometimes obsolete.

Length 14.5, diam. 2.75 mm.; whorls 16½.

Length 13.5, diam. 3 mm.; whorls 16.

Length 11.5, diam. 2.6 mm.; whorls 14¾.

Length 16, diam. 3 mm.; whorls 17 (Pfr., type).

Length 13, diam. 2.66 mm. (Pfr.).

Western Cuba: Banos de San Diego on stones (Gundlach, Arango); Hato Caimeto (Wright).

Cyl. integra Pfr., Malak. Bl., iii, 1856, p. 47; Monogr., iv, p. 704; vi, 379; Conchyl. Cab., p. 31, pl. 4, f. 16-18.—Gundlach, Malak. Bl., iv, p. 47.—Arango, Contrib., p. 120.—Sowerby, C. Icon., xx, pl. 10, f. 93 (bad).

Somewhat like *U. hidalgoi*, though that is a much smoother shell with the neck longer. In one small specimen opened, the sculpture of the pillar is reduced, there being only one weak thread revolving above the usual lower one (fig. 74), so delicate and so little twisted that it would hardly be noticed except by careful examination. Perhaps this indicates another species, but it may be only an extreme variation of the usual type.

106. U. imparata (Arango).

Shell not rimate, fusiform-cylindric, rather solid, glossy, rather closely, obsoletely striate, whitish. Spire regularly tapering, entire. Suture deep, not crenulate. Whorls 17, flattened, the last subangulate, shortly free. Aperture subcircular, the peristome a little reflexed. Internal column encircled by two thin lamellæ. Length 16, diam. 2.25 mm. (*Arango*).

Cuba.

Cyl. imparata Arango, Proc. A. N. S. Phila. 1882, p. 108. —*C. imporata* Gdlch., Paetel, Catalog, ii, p. 248 (1889).

Group of U. capillacea.

Small, corneous or pale, unicolored, thin species, with the axial armature reduced to a single lamella or spiral thread. These forms were formerly grouped in *Tomelasmus*, but it is now clear that they are very closely related to the small, thin forms of *Gongylostoma*. The axial lamellæ in this group are variable structures, their proportions evidently less constant than external sculpture and coloration in some cases. There is, moreover, variation in the development of the upper

spiral thread or cord, which makes it difficult to tell, in some cases, whether a specimen is to be considered to have one or two axial spirals

107. U. MACHOI (Arango).

Shell cylindric-turrete, truncate, thin, obliquely delicately and closely striate, glossy, whitish. Whorls 10 to 11, a little convex, the last sculptured with more widely spaced riblets. Suture deep, simple. Aperture subcircular, the peristome simple, white. Internal column twisted with a single thread. Length 12, diam. 3 mm. (*Arango*) .

Western Cuba: Canasi, near Matanzas.

Cyl. machoi ARANGO, Anales de la Real Acad. de Ciencias Med., Fis. y Nat. de la Habana, xii, p. 282 (1876) ; Contrib., p. 113.

At first sight it looks like a small variety of *C. elegans*, but the internal pillar differs widely (*Arango*).

108. U. GARCIANA ('Wright' Presas). Pl. 58, figs. 67, 68.

Shell subcylindric-fusiform, somewhat swollen in the middle, tapering above, truncate; thin, corneous, lustreless. Surface sculptured with narrow, widely spaced riblets, 28 to 30 on a whorl, becoming crowded on the latter part of the last whorl. Whorls convex, the last shortly free, rounded beneath. Aperture subcircular, the lip white, thickened and expanded. Axis a little sinuous, being encircled by a low, spiral cord, which in some upper whorls is more or less denticulate (pl. 64, fig. 12).

Length 11, diam. 3.3 mm.; whorls 9.

Length 10, diam. 2.6 mm.; whorls 8½.

Length 11 to 12, diam. 3 mm.; whorls 9, in an entire specimen 15 (Presas).

Western Cuba: Palmasola, near Matanzas (Wright); Camarioca (Gundlach).

Cyl. garciana Wright mss., PRESAS, in Poey's Repertorio fisico-natural de la isla de Cuba, i, pt. 8, p. 220 (November, 1865).—PFR., Malak. Bl., xiii, 1866, p. 62; Monogr., vi, p. 374. —ARANGO, Contrib., p. 117.—Not *C. garciana* SOWERBY, C. Icon., xx, pl. 8, f. 66.

Has the external sculpture of *U. crispula* and its allies, or of *U. artemesiæ*, but the single weak spiral of the axis distinguishes *garciana*.

109. U. REMOTA (Arango).

Shell cylindric-turrete, rather thin, thread-ribbed, diaphanous, pale corneous, the riblets remote, whitish. In the single specimen the apex is truncate, 10 whorls remaining, rather flattened, the last subcarinate beneath, free in front. Aperture subcircular, the peristome shortly expanded, subangulate at the place of the carinæ. Internal column encircled by a single lamella. Length 13, diam. 3 mm. (*Arango*).

Western Cuba: Sierra de Guira, in dist. San Diego de los Banos, prov. Pinar del Rio (Arango).

Cyl. remota ARANGO, Contrib., p. 277 (1880).

Shell very like *C. guirensis*, but the whorls are wider, flatter, and the internal column is one-lamellate, and like *C. gutierrezi*, but the column is different and the riblets are more indistinct (*Arango*).

110. U. MORALESI ('Gundl.' Arango).

Very similar to *Cyl. elegans* in external features of the shell, but the internal column differs, being encircled by a thick thread. (*Arango*).

Western Cuba: Ceiba Mocha, near Matanzas (Gundlach).

Cyl. moralesi Gundl. mss., ARANGO, An. Real Acad. Cien. Habana, xii, p. 283, no. 10 (1876); Contrib., p. 113.

111. U. CONCRETA ('Gundl.' Pfr.). Pl. 55, fig. 7.

Shell shortly rimate, cylindric-turrete, thin, smooth, pellucid, whitish-hyaline. Spire slowly tapering, truncate; suture simple. Whorls remaining 11, flattened, the last shortly free, closely striate in front, subsulcate near the axial chink. Aperture oblique, circular; peristome narrowly expanded and a little reflexed. Internal column with a thread-like spiral ("columna interna filoso-torta"). Length 12, diam. 2.66, aperture diam. 2.25 mm. (*Pfr.*).

Western Cuba: Sitio Nuevo and Punta de Jaula, both near Guane, Pinar del Rio (Wright).

Cyl. concreta Gundlach mss., Pfr., Malak. Bl., xi, 1863, p. 8, no. 54; Monogr., vi, p. 363; Novit. Conch., iii, p. 435 (but not pl. 97, f. 12-15).—Arango, Contrib., p. 108.—Sowb., C. Icon., pl. 12, f. 113 (?).

The original description is given above. Pfeiffer subsequently figured as *concreta* another species from the same localities, and hardly distinguishable in external features, but differing in having two axial spirals. This form has been named *distincta* (see no. 98).

U. concreta is sometimes nearly smooth, but varies to weakly striate. The shape is either subcylindric or swollen below, the upper third or more of the length tapering rather rapidly to a narrow truncation. The slender axis is encircled by a thin lamella near the base.

112. U. capillacea (Pfeiffer). Pl. 55, figs. 5, 8.

Shell cylindric below, the *upper half tapering* to the rather small, *entire* apex; thin, bluish-white, the upper whorls usually dirty brownish from the contained dry viscera. Surface glossy, very closely and very finely striate. Whorls 13 to 14, convex, the last prolonged free forward and downward in a moderately short neck, which is more coarsely striate, with wider intervals than the rest of the shell. Aperture round, oblique; peristome continuous, evenly thickened and reflexed throughout. Axis encircled low in each whorl by a *weak, low lamella,* the edge of which is more or less distinctly crenulate.

Length 10.5 to 12, diam. 2.5 mm.

Western Cuba: Vinales, type loc.; also Isabel Maria, dist. of Pinar del Rio (Wright).

Cyl. capillacea Pfr., Malak. Bl., xi, 1863, pp. 9, 129; Monogr., vi, p. 372.—Arango, Contrib., p. 115.

A very finely striate, bluish-white, subtranslucent shell, with the axial lamella weak. The neck is sometimes shorter than in the example figured.

113. U. VOLUBILIS (Morelet).

"Shell cylindric-subulate, slightly truncate, smooth, pellucid whitish. Whorls 19, a little convex, the last disjoined, cylindric, forming an obrotund, oblique aperture; peristome free throughout, a little thickened, narrowly reflexed. Length .15, diam. 3 mm." (*Morel.*).

Western Cuba: Pan de Guajaybon (Morelet), in Pinar del Rio.

Cyl. volubilis MOREL., Testacea Noviss., i, p. 11, no. 17 (1849).—PFR., Monogr., iii, p. 576.—ARANGO, Contrib., p. 115.

The internal structure of the true Mt. Guajaybon *volubilis* is apparently unknown. Pfeiffer placed *saxosa* Poey as a synonym of *volubilis,* but in *Monographia,* vi, p. 372, he says that the axis of the latter has a weak spiral thread.

114. U. CRASSILABRIS (Arango).

Shell rimate, subcylindric, rather solid, obliquely remotely lirate, brownish; spire shortly truncate, the suture subcrenulate. Whorls remaining 11, rather flat, the last obsoletely carinate, shortly solute; peristome white, reflexed, especially the right margin. Internal column having one weak lamina below. Length 12.5, diam. 3 mm.

Cuba.

Cyl. crassilabris AR., Proc. A. N. S. Phila. 1882, p. 108 (June 27, 1882).

Section *Tomelasmus* Pils. & Van., 1898.

P. & V., Proc. A. N. S. Phila. 1898, pp. 271, 276. Type *U. torquata* (Morel.). Misquoted *Tornelasmus,* Zool. Record for 1898, Moll., p. 60.

This group as originally defined must be abandoned, as it is now known that the reduction of the lamellæ to a single sub-basal one occurs in various phyla. The section is here retained for a number of groups, perhaps more allied to one another than to species of other sections, but still so heterogeneous as to make a general definition almost impracticable.

Group of U. torquata.

Smooth or striate species with the axis straight, bearing a single, thin, conspicuously serrate, sub-basal lamella. Rejected portion of spire very short, the apex smooth and rather large. Last whorl adnate or very shortly free, usually encircled by a basal brown band; the basal keel weak or obsolete.

In addition to the following species, *Cyl moreleti* Pfr. may belong here.

I. Peristome *continuous,* free or shortly adherent above.

1. Shell corneous, slender, the diam. contained 4 to 7 times in the length.

a. Base strongly carinate. *U. acus,* no. 121.

a[1]. Basal keel weak or wanting.

b. Rib-striate; length 17-22, diam. 3.7-4.7 mm. *U. thomsoni,* no. 122.

b[1]. Wrinkle-striate; l. 21-23, diam. 4.2-4.8 mm. *U. colorata,* no. 123.

b[2]. Very weakly, coarsely striate; length 18-23, diam. 3.7-3.8 mm. *U. adnata,* no. 119.

2. Shell whitish, stouter, the diam. contained 3½ to 4 times in the length; whorls 8½-10.

a. Closely striate, the striæ as wide as the intervals; length 20-24, diam. 5.7-7 mm. *U. arcustriata,* no. 124.

a[1]. Rib-striæ more spaced, much narrower than the intervals; length 21.5-26, diam. 5.4-6 mm. *U. assimilis,* no. 125.

II. Peristome interrupted or distinctly adnate above; shell smoothish, more or less crenulate below sutures, last whorl striate.

1. Dotted and streaked with corneous on a cream-white ground; very weakly striate. *U. irrorata,* no. 117.

2. Pale fulvous, a little marbled with ashy-white; obsoletely and remotely striate; base subangular; length 24, diam. 4 mm.; whorls 17. *U. crenulata,* no. 120.

3. Banded but otherwise unicolor.
   a. Opaque, flesh-colored, the band ascending above the suture. *U. sauvalleana,* no. 116.
   *a*¹. Corneous, somewhat transparent.
      b. Length 26-30, diam. 5-6 mm.; very finely, subobsoletely striate. *U. torquata,* no. 115.
      *b*¹. Smaller, slender, diam. about 3-4 mm.
         c. Base strongly carinate. *U. acus,* no. 121.
         *c*¹. Base obsoletely or thread- or cord-carinate.
            d. Spire smooth. *U. decolorata,* no. 118.
            *d*¹. Spire weakly, coarsely striate. *U. adnata,* no. 119; *U. crenulata,* no. 120.

115. U. TORQUATA (Morelet). Pl. 56, figs. 12, 13, 14, 15, 16.

Shell shortly rimate, cylindric, the upper half tapering slowly to a narrow truncation or an obtuse apex, thin; corneous, the last whorl girt below the middle with a red-brown band. Surface smoothish, glossy, under a lens showing very fine, nearly effaced striation, which becomes more distinct on the last whorl. Whorls slightly convex, inconspicuously crenulate below the suture, the last rounded beneath, encircled by a slight keel below the band; not free in front. Aperture rounded-oval, oblique, the peristome expanded, interrupted above. Columella obliquely truncate below. Axis encircled near the base in each whorl by a thin, acutely and strongly serrate lamella.

Length 30, diam. 5.2 mm.; whorls 12¼.

Length 26.5, diam. 5 mm.; whorls 11.

Length 28, diam. 5 mm.; whorls 16 (apex entire).

Length 27, diam. 6 mm.; whorls 12 (Morelet, type).

Western Cuba: Mt. Guajaybon (A. Morelet); Rangel, in the woods on trees, on the Taco Taco river, Mr. Blain's estate (Gundlach), both in Pinar del Rio.

Cyl. torquata Morel., Testacea Novissima, i, p. 10, no. 13 (1849).—Pfr., Monogr., iii, p. 579; vi, 358; Conchyl. Cab., p. 66 ("torquato"), pl. 7, f. 19, 20; pl. 8, f. 23.—Gundlach, Malak. Bl., iv, 1857, p. 46.—Arango, Contrib., p. 104.—*Urocoptis* (*Tomelasmus*) *torquata* Morel., Pils. & Van., Proc. A. N. S. P. 1898, p. 276, pl. 17, f. 8 (axis).

Similar to *U. sauvalleana,* but less narrow, and there is no band above the suture, and the surface is very finely though shallowly striate, while in *sauvalleana* it is smooth. The deciduous portion of the spire is very short and not especially attenuate (fig. 15); in this the species of this group resemble *Pycnoplychia,* and are unlike typical *Gongylostoma.*

116. U. sauvalleana (Gundlach). Pl. 56, figs. 20, 21, 22.

Shell shortly rimate, cylindric, the upper third or half slowly tapering to the narrow truncation, or retaining the spire complete; thin; surface smooth and glossy, "opaline flesh-colored," with a narrow brown or reddish band or line above the suture. Whorls slightly convex, the last not free, rounded beneath, its latter half finely striate; girt below the middle with a narrow purplish-brown band. Suture slightly crenulate. Aperture irregularly oval, slightly oblique, the peristome rather broadly expanded, shortly interrupted above; columella obliquely truncate below. Axis slender, encircled near the base with a thin, rather wide serrate lamella.

Length 30, diam. 5 mm.; whorls 15.

Length 32, diam. 4 mm.; whorls 11.

Length 26.5, diam. 4.2 mm.; whorls 18.
Length 27, diam. 4.5 mm.; whorls 18.
Length 23.5, diam. 4.5 mm.; whorls 16.
} Apex entire.

Western Cuba: Mt. Rangel, on trunks and limbs of trees (Gundlach); Retiro (Chas. Wright); Santa Cruz de los Pinos, dist. of San Cristobal, Pinar del Rio (Arango).

Cyl. sauvalleana Gundl., Malak. Bl., iii, 1856, p. 41; iv, p. 46; Poey's Memorias, ii, p. 16 (1857).—Pfr., Monogr., iv, p. 710; Conchyl. Cab., p. 64, pl. 7, f. 10, 11.—Sowb., C. Icon., xx, pl. 6, f. 50.—Arango, p. 104.

Gundlach remarks that he found this species eastward of Mr. Blain's estate, where *torquata* occurs, and that where one of these species lives the other is not found. Unlike *torquata,* the peripheral band follows the suture, bordering it above.

117. U. IRRORATA (Gundlach). Pl. 56, figs. 17, 18, 19.

Shell shortly rimate, cylindric, the upper half tapering to a narrow truncation or retaining the early whorls; thin; cream-white, profusely dotted and streaked with corneous, and generally having a corneous or brown girdle around the base. Surface glossy, very weakly but coarsely striate, the base and latter part of the last whorl rib-striate. Whorls somewhat convex, more or less strongly crenate or denticulate below the suture; the last with a low basal keel, not free. Aperture obliquely oval, the peristome expanded, interrupted above; columella obliquely truncate. Axis slender, with a single thin, serrate spiral lamella.

Length 24, diam. 4.7 mm.; whorls 12 (Banos de S. Diego).

Length 17.5, diam. 3.8 mm.; whorls 11 (Vinales).

Length 26, diam. 4.5 mm.; whorls 18 (apex entire; B. Honda).

Length 22, diam. 3.8 mm.; whorls 17½ (apex complete; S. Jose de Cuba).

Length 24, diam. 4.5 mm.; whorls 17 (Gundl., type).

Western Cuba: San Diego de los Banos, on stones (Gundlach); Santa Catalina, San Jose de Cuba, Sagua, Isabel Maria, Vinales (Chas. Wright); Pan de Azucar (Arango); Bahia Honda (Bld.), all in prov. Pinar del Rio.

Cyl. irrorata GUNDL., Malak. Bl., iii, 1856, p. 41; in Poey, Memorias, ii, p. 16, pl. 2, f. 19.—PFR., in Conchyl. Cab., p. 64, pl. 7, f. 12, 13; Malak. Bl., xi, p. 128; Monogr., iv, p. 171.—SOWERBY, C. Icon., xx, pl. 4, f. 32.—ARANGO, Contrib., p. 105.

The dotted and streaked coloration is characteristic. The following form is probably a synonym.

U. tumidiora (Sowerby). Pl. 56, fig. 23. "Shell thin, fulvous, variegated with horny brown, rather pyramidal; whorls short, rather convex, slightly crenated at the suture,

with a very narrow red band below, the last notched [rimate]. Aperture connected, anteriorly produced, expanded, a little contracted above the middle. Cuba." (*Sowb.*).

Cyl. tumidiora SOWERBY, in Reeve's Conchologia Iconica, xx, pl. 8, f. 65 (April, 1875).

"The whorls are much shorter and more convex than in *Cylindrella irrorata*" (*Sowb.*).

118. U. DECOLORATA ('Gundl.' Pfr.). Pl. 55, figs. 95, 96, 97.

Shell very shortly rimate, *slender,* cylindric, the upper third or half tapering to a narrow truncation; thin, pale corneous, with a faint brown band below the middle of the last whorl; the surface glossy, usually worn on the apertural side, nearly smooth, the last whorl elegantly, finely rib-striate on the base and behind the outer lip, the early whorls also showing traces of fine striation. Whorls slightly convex, weakly, coarsely crenate below the suture, the last having a low cord-like basal keel, not free in front. Aperture rounded-oblong, the peristome expanded, wholly adnate or interrupted above. Axis slender, encircled by a single thin, serrate lamella.

Length 25-26, diam. 4 mm.; whorls 14.

Length 20, diam. 3.7 mm.; whorls 12.

Length 22.5, diam. 3.6 mm.; whorls 17½ (apex perfect).

Length 24, diam. 4.5 mm.; whorls 14 (Gundl.).

Western Cuba: Santa Cruz de los Pinos, on trees (Gundlach).

Cyl. decolorata Gundl. mss., PFR., Malak. Bl., xi, 1863, p. 4, no. 46; Monogr., vi, p. 358; Novit. Conch., p. 454, pl. 100, f. 6, 7.—ARANGO, Contrib., p. 104.—CROSSE, J. de C., 1890, p. 209.

Near *U. sauvalleana,* but more slender, thinner, with no sutural band, and with stronger sculpture on the latter part of the last whorl. About 5½ whorls are above the plug in unbroken shells, ordinary truncate individuals having 12 to 14 whorls. Most adult shells have the gloss worn from the ventral side, which becomes dirty white, a circumstance which suggested the name. The same wearing is occasionally observed in *U. torquata* and *sauvalleana.*

119. U. ADNATA (Pfeiffer). Pl. 55, fig. 98.

Shell shortly rimate, cylindric-turrete, rather thin, nearly smooth, very lightly striate at the sutures, pale corneous; spire tapering above, the apex truncate; suture light, subcrenulate. Whorls remaining 13 to 15, a trifle convex, the last not free, rib-striate in front, carinate at the base. Aperture slightly oblique, oblong-rounded, narrowed by a somewhat tooth-like columellar fold within; peristome continuous, adnate above, elsewhere subequally expanded. Length 19, diam. 3.66 mm. (*Pfr.*).

Western Cuba: Sumidero, a hacienda in district of Pinar del Rio (Gundlach).

Cyl. adnata PFR., Malak. Bl., xi, 1864, p. 129; Monogr., vi, p. 361; Novit. Conch., p. 453, pl. 100, f. 1-3.—ARANGO, Contrib., p. 106. *C. adumpta* Pfr., CLESSIN, Nomencl. Hel. Viv. p. 277, no. 41 (1878).

Pfeiffer's original description is given above, and his enlarged figure copied, pl. 55, fig. 98. The shell is *very weakly, coarsely* striate, with wide-spaced rib-striæ on the latter part of the last whorl, and there is often a faint band on the last whorl, as in others of the group. In shape *U. adnata* closely resembles *U. thomsoni* and *U. decolorata,* differing from the former in the weak sculpture and adnate peristome (though occasionally the parietal edge is distinctly raised); from *U. decolorata* in being less smooth and less closely rib-striate behind the outer lip. The axis is slender, encircled by a strongly serrate, thin lamella. Specimens measure:

Length 21, diam. 3.8 mm.; whorls 12.

Length 22.5, diam. 3.7 mm.; whorls 14.

Length 18, diam. 3.7 mm.; whorls 11½.

120. U. CRENULATA (Gundlach). Pl. 55, figs. 3, 4.

Shell cylindric-conic, rimate, subdiaphanous, glossy, truncate; obsoletely and remotely striate; pale fulvous, a little marbled with ashy-white, and having a narrow thread-like reddish basal band. Whorls 17, a little convex, the last sculptured with stronger striæ and subcarinate. Suture subcrenulate. Aperture oval, subvertical, slightly contracted

by the columellar fold; peristome thin, expanded, the upper margin adnate to the preceding whorl. Length 24, diam. 4 mm.; varies to smaller diameter (*Gundlach*).

Western Cuba: Mt. Guajaybon, prov. Pinar del Rio, on trees and rocks.

Cyl. crenulata GUNDL., Malak. Bl., iii, 1857, p. 42.—PFR., Monogr., vi, p. 358; Novit. Conch., p. 454, pl. 100, f. 4, 5.—ARANGO, Contrib., p. 105.

Pfeiffer finally considered this a variety of *U. acus,* but Arango retains it distinct. The thread-carinate rather than strongly carinate base is unlike *acus,* and it is apparently nearer *U. adnata.* I have not seen specimens.

Pfeiffer describes it thus: "Shell subarcuate-rimate, cylindric-turreted, entire or shortly truncate, thin, arcuate-striatulate, pale corneous. Spire long, noticeably tapering above, the vertex rather acute; suture distinctly crenulate. Whorls 20 in an entire specimen, a little convex, the last costulate, marked with a reddish line, and a thread-like carina below it, not free in front. Aperture a little oblique, rounded-oval; columella subplicate; peristome thin, expanded, and appressed to the preceding whorl or nearly interrupted. Length 26, diam 5 mm.; apert. 4⅔ mm. long."

The figures are from Pfeiffer's, and doubtless represent an authentic specimen.

121. U. ACUS (Pfeiffer). Pl. 55, figs. 93, 94.

Shell very shortly rimate, slenderly cylindric or pillar-shaped, the upper third slowly tapering to a narrow truncation; thin, pale corneous. Surface *glossy, smooth except below the suture, where it is coarsely striate,* the last whorl becoming rib-striate, the riblets rather widely spaced. Whorls somewhat convex, the last not free in front, *the base defined by a strong, cord-like keel,* crenulated by the striæ. Aperture irregularly rounded, the peristome expanded, continuous across but adnate to the parietal margin. Columellar fold emerging, obliquely truncate below. Axis slender, somewhat sinuous, encircled by a thin, serrate lamella near the base in each whorl.

Length 24, diam. 3.5 mm.; whorls 16.

Length 18.2, diam. 2.8 mm.; whorls 16.

Length 24-26, diam. 3.5 mm.; whorls 18-19 (Pfr., types).

Western Cuba: Plantation Cayajabos or Callajabas, district of Artemisa (E. Otto, type locality); Loma del Cuzco (Gundlach); Candelaria (Arango), all in prov. Pinar del Rio.

Cyl. acus Pfr., Symbolæ ad Hist. Hel., i, p. 47 (1841); in Philippi, Abbild., i, p. 182, pl. 1, f. 8; Conchyl. Cab., p. 66, pl. 7, f. 16-18; Malak. Bl., i, 1854, p. 213; ii, 1855, p. 179; Monogr., ii, p. 383; iii, 579; iv, 711; vi, 359.—Gundlach, Malak. Bl., iv, 1857, p. 46.—Sowerby, C. Icon., xx, pl. 7, f. 62.—Arango, Contrib., p. 105.

The special differentiation of this species is the strong basal keel.

122. U. thomsoni (Arango). Pl. 55, figs. 90, 91, 92.

Shell very shortly rimate, cylindric or pillar-shaped, the upper third slowly tapering to the narrow truncation; thin, corneous; surface shining, subregularly and strongly, obliquely rib-striate, the riblets rounded, narrower than the intervals, becoming better defined and thread-like on the last whorl. Whorls somewhat convex, the last barely free in front, rounded beneath, and girt with a reddish band, sometimes very faint. Aperture round-oval, the peristome continuous, shortly free above, expanded. Columella obliquely truncate. Axis slender, somewhat sinuous, encircled by a thin basal lamella serrate with long teeth.

Length 21.6, diam. 4.7 mm.; whorls 12 (plug at 10).

Length 17, diam. 3.7 mm.; whorls 11.

Western Cuba: "La Jagua" (Sierra la Jagua), near La Palma, Pinar del Rio (Arango, type loc.).

Cyl. thomsoni Arango, Proc. A. N. S. Phila. 1884, p. 212, fig. 3 (Nov. 4, 1884).—Crosse, Journ. de Conchyl., 1890, p. 223, pl. 4, f. 4.

Near *U. acus* and *U. decolorata*, but strongly rib-striate. A specimen with the apex perfect has 14 whorls, according to Arango. Figured from a cotype.

123. U. COLORATA (Arango). Pl. 56, figs. 29, 30, 31.

Shell shortly rimate, cylindric, the upper half tapering slowly to the rather narrow truncation, thin, corneous, somewhat translucent, encircled near the base of the last whorl with a red-brown band, which ascends above the suture. Surface glossy, irregularly wrinkle-striate, the striæ coarser below the suture, then often splitting or branching; stronger and narrower on the latter half of the last whorl. Whorls but slightly convex, the last somewhat carinate basally in front, the keel becoming obsolete on the latter half; not free in front. Aperture subcircular, the peristome expanded, continuous, barely free above or very shortly adnate. Axis with a thin, deeply incised, serrate lamella.

Length 23, diam. 4.8 mm.; whorls 11.

Length 21, diam. 4.2 mm.; whorls 12.

Western Cuba: La Chorrera, Pinar del Rio.

Cyl. colorata ARANGO, Proc. Acad. N. S. Phila. 1882, p. 106 (June 27, 1882); 1884, p. 212, f. 5.—CROSSE, J. de C., 1890, p. 223, pl. 4, f. 2.

U. thomsoni and *U. decolorata* and *U. adnata* are narrower shells, the former one being probably the most closely related to *colorata*. *U. assimilis* has more clearly-cut striæ and a different coloration.

124. U. ARCUSTRIATA ('Wright' Pfr.). Pl. 56, figs. 24, 25.

Shell shortly rimate, cylindric, the upper half slowly tapering to a truncation somewhat less than one-half the diam. of the shell; moderately solid; whitish with a purple-brown basal band, sometimes showing a little along the suture. Nearly lustreless, closely, finely and regularly striate, the striæ arcuate, *as wide as the intervals;* a little more spaced on the latter part of the last whorl. Whorls convex, the last broadly rounded beneath, not free in front. Aperture circular, the peristome expanded, continuous, touching the preceding whorl above, or barely free. Columella strongly obliquely truncate below. Axis encircled by a basal thin lamella, very deeply cut into long teeth.

Length 24, diam. 6.7 mm.; whorls 9.

Length 23, diam. 7.2 mm.; whorls 8½.

Length 20, diam. 5.7 mm.; whorls 8½.

Length 21, diam. 7 mm.; whorls 9 (Pfr., type).

Western Cuba: Between Caiguanabo and Chorrera (Wright, type loc.); San Andres, near Vinales, Pan de Azucar (Wright), all in prov. Pinar del Rio.

Cyl. arcustriata Wright, Pfr., Mal. Bl., xi, 1863, p. 3, no. 44; Novit. Conch., p. 259, pl. 65, f. 5-7; Monogr., vi, p. 369.—Arango, Contrib., p. 112.

Wide for its length, approaching the contour of the Jamaican Cylindrellas. Specimens before me from the three localities agree in all respects. It is wider and more finely striate than *U. assimilis*.

125. U. assimilis (Arango). Pl. 56, figs. 26, 27, 28.

Shell cylindric, slowly tapering above, whitish with a purple-brown basal band, narrowly showing at the suture. Somewhat shining, rib-striate, the riblets much coarser than in *U. arcustriata*, about *half as wide as the intervals*, more widely spaced on the latter half of the last whorl, as usual. Whorls slightly convex, the last rounded below, very shortly free in front. Aperture subcircular, the peristome expanded, continuous, free above. Columellar fold emerging nearly to the lip. Axial lamella deeply cut into strong, thin teeth (pl. 55, fig. 99).

Length 21.5, diam. 5.4 mm.; whorls 9½.

Length 24, diam. 5.6 mm.; whorls 10.

Length 23-26, diam. 6 mm.; whorls 12 in an entire shell (Arango).

Western Cuba: La Jagua, near La Palma, Pinar del Rio (Arango).

Cyl. assimilis Arango, Proc. A. N. S. Phila. 1884, p. 211, fig. 2 (Nov. 4, 1884).—Crosse, J. de C., 1890, p. 223, pl. 4, f. 1.

Near *U. arcustriata*, but more cylindrical, with coarser, more widely spaced riblets, and slightly more free last whorl.

Group of U. coerulans.

Shell moderately stout, truncate, *variegated with white on a corneous or brown ground,* the aperture usually brownish within, basal keel obsolete; axis with one or two spiral lamellæ, the lower denticulate, at least above; *a row of whitish subsutural beads developed.* Western Cuba.

Key to Species.

I. Axis encircled by a single, sub-basal lamella.

1. Length 20 to 21, diam. 4.5 to 5.5 mm.; whorls 11-12; solid, brown and white, regularly rib-striate; axis weakly spiral above the lamella. *U. coerulans,* no. 135.
2. Length 14 to 15.5 x 4.3 to 4.6 mm.; whorls 8 to 9; otherwise like *U. coerulans.* *U. c. incerta,* no. 135a.
3. Length 13 to 15, diam. 3.3 to 4 mm.; whorls 10½ to 11½; corneous variegated with cream-white; whitish spaced riblets. *U. discors,* no. 130.
4. Length 11 to 14, diam. 2.5 mm.; like *variegata,* but with more remote riblets. *U. canteroiana,* no. 136.
5. Length 9.5 to 11, diam. 2.5 to 3 mm.; whorls 7½ to 8½; riblets few and irregular, suture with curved, hook-like nodes; axis somewhat spiral above the lamella. *U. unguiculata,* no. 129.
6. Length 9 to 10.3, diam. 2.2 to 2.3 mm.; whorls 8 to 9½; brownish with white streaks and some white sutural nodes, nearly smooth or sparsely ribbed. *U. gonzalezi,* no. 127.
7. Length 11 to 12, diam. 2.5 to 2.7 mm.; brown, sometimes variegated with white, and having regular, white sutural beads; the surface closely striate. *U. joaquini,* no. 128.

II. Axis with two subequal lamellæ above the middle of the shell, one in the lower whorls, the axis often weakly spiral above it.

1. Shell finely striate, with small, regular subsutural beads; length 12 to 15, diam. 3 to 3.2 mm.; whorls 9 to 10½. *U. affinis,* no. 132.

2. Sculptured with spaced rib-striæ.
   a. Length 10.4 to 13, diam. 3.5 to 3.7 mm.; whorls 7½ to 9⅓. *U. d. lagunillensis,* no. 130a.
   b. More slender, with more whorls; length 12.2 to 15.5, diam. 2.7 to 3 mm.; whorls 10½ to 12. *U. diaphana,* no. 131.

III. Axis with two subequal lamellæ.
1. Slender, length 12 to 16, diam. 2.7 mm.; smooth or sparsely, irregularly ribbed, the long, descending neck ribbed; suture sparsely white-beaded. *U. hidalgoi,* no. 126.
2. Length 12, diam. 3.5 mm.; whorls 10-11; distinctly arcuately striate. *U. heynemanni,* no. 133.
3. Stouter, the diam. one-fourth the length, 13 to 15 x 4 to 5 mm., with 7 to 8 whorls; finely striate. *U. obliqua,* no. 134.

126. U. HIDALGOI (Arango). Pl. 54, figs. 78, 79.

Shell cylindric or somewhat swollen in the middle, slightly tapering to the wide truncation; thin, brownish, translucent, marked with few or many longitudinal *opaque white streaks,* and with small white beads irregularly strung along below the suture, usually obsolete on the later whorls. Surface glossy, nearly smooth, *the latter half of the last whorl sculptured with narrow, wide-spaced riblets.* Whorls slightly convex, the last becoming free, with *a long, rounded, descending neck,* which is very indistinctly angular beneath, and has an axial groove above. Aperture rounded, slightly narrower above, light chestnut-brown inside, the white lip rather widely reflexed. Axis encircled by two subequal lamellæ, the lower one minutely spinose.

Length 12, diam. 2.7 mm.; whorls 8½.
Length 16, diam. 2.7 mm.; whorls 10½. } Cerro de Cabras.
Length 15-16, diam. 2.5 mm.; whorls 9-12 (Arango).

Western Cuba: Bebedero, in Pinar del Rio (type loc.); Cerro de Cabras, Pinar del Rio (Arango).

Cyl. hidalgoi ARANGO, Contrib., p. 107.—CROSSE, Journ. de Conch., 1890, p. 217, pl. 4, f. 3, *a, b.*

Distinct by its smooth surface, white streaks, the long, costulate neck, and wide lip. The specimens figured are from Cerro de Cabras, received from Arango.

Var. BREVICERVIX Pils., n. v. Pl. 57, fig. 44.

Shell shorter than *U. hidalgoi,* the last whorl *hardly descending,* the *neck short;* surface almost lustreless, *sparsely and irregularly, obliquely ribbed,* and with conspicuous subsutural whitish nodes; the neck ribbed as in *hidalgoi.* Aperture brown within. Axis bilamellate, the lamellæ about equal.

Length 12, diam. 2.7 mm.; whorls 9½.

Length 11.2, diam. 2.7 mm.; whorls 8½.

Pinar del Rio: "Mogotes del Cerro de Cabras," on the plantation "Vega de Curull" (Arango).

Cyl. hidalgoi var., ARANGO, Contrib., p. 277.

The axis is similar to that of *U. hidalgoi,* bearing two subequal lamellæ in all the whorls but the last one.

127. U. GONZALEZI Pilsbry, n. sp. Pl. 57, fig. 43.

Shell small, tapering from the last or the penult. whorl to the rather wide apical truncation, glossy, brown-corneous, subtransparent, splashed with milk-white in streaks. Smooth, with some irregular wrinkles or a few very wide-spaced riblets, the latter half of the last whorl ribbed. Suture crenate with white nodes. Whorls convex, the last shortly free, only slightly descending. Aperture rounded, the white lip flatly reflexed. Axis slender, encircled by a single, thin, sub-basal lamella.

Length 10.3, diam. 2.3 mm.; whorls 9½.

Length 9, diam. 2.2 mm.; whorls 8.

Ceja de Poncio, Pinar del Rio (Arango).

Similar to *U. hidalgoi,* but more tapering, with the neck short, and having only one axial lamella.

128. U. JOAQUINI Pilsbry, n. sp. Pl. 64, figs. 5, 6.

Shell subcylindric, slowly tapering above to a wide truncation, thin, brown, either uniform or with white patches or

streaks, the suture bordered below with a regular row of white beads. Surface glossy, *closely and regularly striate.* Whorls convex, the last produced in a neck which is white above, shorter and less descending than in *U. hidalgoi.* No basal keel. Aperture subcircular, brownish inside, the peristome thin, white, and expanded. Axis slender, straight, encircled by a single sub-basal, rather remotely dentate lamella.

Length 12, diam. 2.7 mm.; whorls 8¾.

Length 11, diam. 2.5 mm.; whorls 8¾.

Western Cuba: Pinar del Rio (Wright).

This species belongs to the group of *U. hidalgoi,* differing from that form in sculpture, the single axial lamella and the shorter neck. It is larger than *U. gonzalezi,* and more finely sculptured. A small group of closely related forms consists of the species *joaquini, gonzalezi, hidalgoi* and *unguiculata.* The types of this species were found among specimens of *U. affinis* collected by Wright.

129. U. UNGUICULATA (Arango). Pl. 57, fig. 52.

Shell turreted, slowly tapering from the last whorl to the wide truncation, brownish-corneous variegated with white. Surface glossy, sculptured with a few irregularly and widely spaced riblets, the latter half of the last whorl ribbed. Suture crenate, the *subsutural nodules hook-shaped, the acuminate upper end of each reaching up and forward.* Last whorl very shortly free, having a low keel beneath. Aperture subcircular, the lip reflexed. Axis having a compressed, sub-basal lamella, and an indistinctly spiral cord above it.

Length 11, diam. 3 mm.; whorls 8½.

Length 9½-10, diam. 2½ mm.; whorls 7-8 (Arango, types).

Western Cuba: Around the town of Pinar del Rio (Arango).

Cyl. unguiculata ARANGO, Contrib., p. 277 (1880).

Somewhat intermediate between *U. hidalgoi* and the species grouping around *U. discors;* but the bent or hooked sutural nodes distinguish it, though they are far from conspicuous. Figured from a cotype.

130. U. DISCORS (Poey). Pl. 57, figs. 42, 45.

"Differs from *C. variegata* Pfr. by the anteriorly less attenuate shell, more distant riblets and crenulate suture. Axis spirally one-lamellate" (Poey).

Shell cylindric-fusiform, the upper third or half tapering to the truncation, thin, corneous, profusely variegated with cream-whitish. Surface scarcely glossy, sculptured with whitish riblets, separated by intervals of about three times their own width, and regularly crenate at the suture by low whitish nodules, about one to each two riblets. Whorls but slightly convex, the last shortly free, slightly descending, weakly carinate below. Aperture rounded, light brown inside; peristome white, expanded, subreflexed. Axis straight, slender, encircled by a single thin, sub-basal lamella.

Length 14.5, diam. 3.3 mm.; whorls 11½.

Length 13, diam. 3.4 mm.; whorls 10½.

Length 15, diam. 4 mm.; whorls 11 (Pfr).

Western Cuba: Sierra de Guane, prov. Pinar del Rio (Poey).

Cyl. discors POEY, Memorias, etc., ii, p. 38.—PFR., Malak. Bl., v, 1858, p. 8; Monogr., iv, p. 702; Malak. Bl., xi, 1864, p. 127 (occurrence at Lagunillas).—ARANGO, Contrib., p. 118.

Very closely related to *U. heynemanni* and *U. diaphana* in external features of the shell, the species being separated chiefly by details of the structure of the axis.

130 a. Var. *lagunillensis* Pils., n. var. Pl. 57, figs. 47, 49.

Shell rather obese, swollen in the middle, though varying to subcylindric forms; variegated with cream on a corneous ground, and with small subsutural beads. Last whorl very shortly free. Axis rather strong, encircled by two lamellæ, the lower much wider below, the upper lamella being merely a low thick cord in the penultimate whorl, becoming thinner and about equal to the lower lamella in the whorls above the middle.

Length 13, diam. 3.7 mm.; whorls 9⅓.

Length 10.4, diam. 3.5 mm.; whorls 7½.

Western Cuba: Lagunillas, in dist. of San Juan y Martinez, prov. Pinar del Rio (Wright).

Probably the specimens referred by Pfeiffer to *U. discors* in Malak. Bl., xi, p. 127, belong to this variety, which differs from *discors* chiefly in the more inflated form and in the development of an upper axial lamella.

131. U. DIAPHANA 'Wright' Pils., n. sp. Pl. 57, fig. 48.

Shell similar externally to *U. discors,* but the axis bears two small subequal lamellæ above, the upper one reduced in the intermediate whorls, where a third small cord is interposed.

Length 15.5, diam. 3 mm.; whorls 12.

Length 12.2, diam. 2.7 mm.; whorls 10½.

Western Cuba (Wright).

? *Cyl. diaphana* Wright, ARANGO, Contrib., p. 117.

Arango gives a confused description of the pillar, and refers to Pfeiffer, who never described the species, but mentions it among the undescribed (Monogr., viii, 449). Crosse merely quotes Arango's reference. The above description is from shells received as *Cyl. diaphana* from Charles Wright. Probably it intergrades with *discors,* the axial structure being quite variable in *Gongylostoma.*

132. U. AFFINIS (Pfeiffer). Pl. 57, fig. 41.

Shell cylindric, the upper third or half tapering to a wide or sometimes rather narrow truncation; brownish-corneous profusely streaked with white, or whitish with corneous flames; thin. Surface somewhat glossy, *finely striate* throughout, the striation coarser on the last whorl, changing to narrow, sharp riblets on the neck. Suture crenulated by small, regular, white beads. Whorls slightly convex, the last free, the neck short or moderately long, slightly descending. Aperture subvertical, rounded, brown inside, the well expanded lip white. Axis encircled by a compressed lamella in the lower whorls, serrate in the median and upper whorls,

a second, upper lamella about equal to the lower, appearing in the whorls above the middle.

Length 15, diam. 3.2 mm.; whorls 10½.

Length 12.5, diam. 3.2 mm.; whorls 9.

Length 12, diam. 3 mm.; whorls 10 (Pfr., type).

Western Cuba: Hacienda Sumidero, district of Pinar del Rio; also Teneria, dist. of Guane, both in prov. Pinar del Rio (Wright).

Cyl. affinis Pfr., Malak. Bl., xi, 1864, p. 127; Monogr., vi, p. 375.—Arango, Contrib., p. 118.

Similar in general appearance to *U. discors,* but much more finely striate.

133. U. heynemanni (Pfeiffer). Pl. 58, figs. 67, 68.

Shell rather deeply rimate, cylindric-turrete, rather solid, closely arcuate-striate, variegated corneous and whitish; spire somewhat swollen in the middle, the apex rather broadly truncate; suture rather closely white-crenate. Whorls 11, a little convex, the last shortly free, obsoletely thread-carinate. Aperture a little oblique, subcircular; peristome free, a little reflexed throughout. Internal column encircled by two compressed, subequal, parallel lamellæ. Length 12½ to 13, diam. 3½ mm. (*Pfr.*).

Western Cuba: La Teneria, in the district of Guane, prov. Pinar del Rio (Wright).

Cyl. heynemanni Pfr., Malak. Bl., xii, 1865, p. 120; Monogr., vi, p. 374.—Arango, Contrib., p. 117.

"Related to *C. discors, affinis* and *albocrenata,* but besides the external characters of the shell, it departs widely from all of them in the structure of the internal pillar."

Much more slender and smaller than *U. obliqua,* which has similar axial structure; the riblets and subsutural tubercles more distinctly raised, white on a pale corneous ground, the specimens before me not otherwise variegated.

Length 12, diam. 3.2 mm.; whorls 10.

Length 12, diam. 3.6 mm.; whorls 11, 1½ above the plug.

U. discors and related species differ by the weaker develop-

ment of the upper axial lamella, which in *heynemanni* is nearly as strong as the lower. There is only a trace of the basal carina.

The figures are from specimens received from Charles Wright.

134. U. OBLIQUA (Pfeiffer). Pl. 58, figs. 53, 54, 55.

Shell rimate, oblong, somewhat swollen, the upper third tapering to a wide truncation; thin; streaked and marbled with white and corneous. Surface rather closely striate, closely crenulate below the sutures, at least on the upper part of the shell. Whorls slightly convex, the last having a distinct, cord-like keel around the base; only shortly free in front. Aperture subcircular, hardly oblique, the lip white, reflexed. Axis encircled by two equal, compressed lamellæ, the lower one of which is weakly denticulate in the upper whorls.

Length 15, diam. 4.8 mm.; whorls 7½.

Length 13, diam. 4 mm.; whorls 7.

Length 14, diam. 5 mm.; whorls 7½-8 (Pfr., type).

Central Cuba: Near Puerto Principe (Chas. Wright).

Cyl. obliqua PFR., Malak. Bl., xi, 1863, p. 11, no. 59; Monogr., vi, p. 360; Novit. Conch., p. 250, pl. 63, f. 18-21.—ARANGO, Contrib , p. 105.—SOWERBY, C. Icon., xx, pl. 4, f. 28.

This species is near *U. incerta, U. heynemanni,* etc., but differs by its two wide and equal axial lamellæ, rather obese shape and larger aperture. In distribution it lies far east of the range of the other members of the group.

135. U. COERULANS (Poey). Pl. 57, figs. 50, 51.

Shell cylindric, tapering to a rather wide or a narrow truncation above, solid, corneous-brown, the last whorl often purple-brown, densely white-ribbed and marbled with white. Surface somewhat glossy, closely and regularly rib-striate throughout. Whorls convex, the last having a low, cord-like basal carina, and very shortly free in front. Suture crenate-beaded. Aperture vertical, dark chestnut inside, the lip con-

tinuous, broadly expanded, white. Axis encircled with a single sub-basal lamella, and in the intermediate whorls having a very weakly spiral cord above.

Length 21, diam. 5.5 mm.; whorls 11⅓ (Guane).

Length 20, diam. 4.5 mm.; whorls 12 (Poey, type).

Western Cuba: Guane, hanging on high rocks (Poey); Teneria and Catalina de Guane (Wright); Portales de Guane (Arango), all in prov. Pinar del Rio.

Cyl. coerulans Poey, Memorias, ii, p. 37, pl. 1, f. 14.—Pfr., Malak. Bl., v, 1858, p. 7; Monogr., iv, p. 700.—Arango, Contrib., p. 112.—*Cyl. cærulans* Poey, Sowerby, C. Icon., xx, pl. 3, f. 21 (bad).

Larger than the related forms. At Catalina, a village in Guane district, Pinar del Rio, Wright collected a much smaller, thinner form, often paler in color; length 17, diam. 4.2 mm., with 10½ whorls, to length 13.5, diam. 3.1 mm., whorls 11.

135 a. Var. INCERTA (Arango). Pl. 57, fig. 46.

Similar to *U. coerulans* in color and sculpture, but more inflated, the axis simple above the sub-basal lamella; and it retains fewer whorls.

Length 15.5, diam. 4.6 mm.; whorls 8⅔.

Length 14.5, diam. 4.5 mm.; whorls 8 (Arango, type).

Length 14, diam. 4.3 mm.; whorls 8.

Puerta de la Muralla, in Guane district, prov. Pinar del Rio (Arango).

Cyl. incerta Arango, Proc. A. N. S. Phila. 1881, p. 15, fig. (May 10, 1881).

Figured from a cotype. It is the merest variety of *U. cocrulans.*

136. U. CANTEROIANA ('Gundl.' Arango).

Differs from *C. variegata* Pfr. by the more remote riblets and especially the one-lamellate internal column. Length of a truncate specimen 11 to 14, diam. 2½ mm. (*Arango*).

La Vigia, Trinidad (Arango).

Cyl. canteroiana Gundl. mss., Arango, An. Real. Acad. Cienc. Habana, xii, p. 284, sp. no. 15 (1876).

I do not know the locality, which may be near Guane, or in Santa Clara province.

Group of U. trilamellata.

Shell opaque, rib-striate, the riblets light on a dull, purplish-brown, corneous-brown or fleshy ground; aperture brown within, a little narrowed above; last whorl more or less free in front; axis with one to three lamellæ, the lowest lamella widest.

Key to Species.

I. Length 3½ to 5 times the diameter.

1. Axis with 3 lamellæ, the upper one small, lower widest.

a. Stout, rather rapidly tapering above; ashy-flesh colored, the narrow riblets parted by wider intervals; length 15.5 to 24, diam. 4.8 to 6 mm.; whorls 8-10.

U. vignalensis, no. 137.

b. Stout, blackish-brown, similar to *vignalensis* but riblets more widely spaced; length 17, diam. 4.5 mm.; whorls 9-10.

U. abdita, no. 138.

c. More slender; dull purplish with strong whitish rib-striæ half as wide as their intervals; upper lamella very small; length 17.5 to 20, diam. 3.4 to 4 mm.; whorls 9 to 12.

U. trilamellata, no. 139.

2. Axis with 2 lamellæ; cylindrical, brown, striate-plicate; length 20, diam. 5 mm.; whorls 10.

U. nubila, no. 140.

3. Axis with 1 thin lamella, 2 hardly noticeable spiral cords above it obsolete in last two whorls; shell tapering above, purplish-brown with narrow, wide-spaced whitish riblets; length 18-19, diam. 4 to 4.5 mm.; whorls 10-12. *U. violacea,* no. 141.

II. Length about 7 times the diameter, only 1 distinct axial lamella.

1. Pillar-shaped, truncate, purplish-brown with oblique, arcuate, wide-spaced whitish riblets; neck rather long; length 16 to 19, diam. 2.1 to 2.7 mm.; whorls 12 to 13. *U. plumbea,* no. 142.
2. Cylindric-subulate, the spire attenuate above, shortly truncate or entire; corneous-brown, the rather close, arcuate riblets paler; neck shorter than in *plumbea;* length 16 to 18, diam. 2.3 mm.; whorls 16 or 17. *U. macra,* no. 143.

137. U. VIGNALENSIS ('Wright' Pfr.). Pl. 46, figs. 65, 66, 67, 68.

Shell cylindric, the upper third rather rapidly tapering to a rather narrow truncation, solid, opaque, ashen flesh colored. Surface lustreless, closely sculptured with narrow riblets separated by much wider intervals, and generally having a series of whitish granules along the suture. Whorls somewhat convex, the last shortly free, the baso-peripheral surface flattened but showing a subobsolete cord in place of the usual keel. Aperture subcircular, *ochre-brown inside,* the peristome white, broadly expanded and reflexed; columella with a distinct fold within. Axis bearing three lamellæ, the lower one largest, crenate, extending to the last whorl, the others disappearing in the penult. whorl. In the last whorl the axis is slender and more or less sigmoid.

Length 24, diam. 5.8 mm.; whorls 10⅓.

Length 15.5, diam. 4.8 mm.; whorls 8.

Length 17.5-22, diam. 6 mm.; whorls 9-10 (*Pfr.*).

Western Cuba· Vinales (Wright); Banos de S. Vicente (Arango).

Cyl. vignalensis Wright mss., PFR., Malak. Bl., xi, 1863, p. 3; Novit. Conch., p. 246, pl. 63, f. 7-9; Monogr., vi, p. 367. —CROSSE & FISCHER, Journ. de Conch., 1870, pp. 12, 25, pl. 4, f. 4, 5 (teeth).—ARANGO, Contrib., p. 110.—SOWB., C. Icon., xx, pl. 9, f. 83.

Differs from *U. Shuttleworthiana* chiefly by its greater solidity, lighter fleshy color, and the dark interior of the mouth. The specimens from Banos de San Vicente, near Vinales, are somewhat more slender than those from Vinales, measuring, length 23.5, diam. 5 mm., with 10¾ whorls.

138. U. ABDITA (Arango).

Shell shortly rimate, swollen-cylindric, rather solid; black-brown, with compressed, whitish, nearly straight and remote ribs. Spire perceptibly tapering from the middle, truncate; whorls remaining 9 to 10, a little convex, the last shortly free, with the ribs scarcely closer, the base subcarinate. Aperture slightly oblique, subcircular; columella a little plicate, the peristome expanded. Internal column three-lamellate. Length 17, diam. 4.5; diam. of apert. 1.75 mm. (*Arango*).

Western Cuba: Hato de Morales, in Pinar del Rio.

Cyl. abdita ARANGO, Contrib., p. 276 (1880).

Similar to *C. vignalensis,* but it differs in form, color and the remote ribs (*Arango*).

139. U. TRILAMELLATA (Pfeiffer). Pl. 46, figs. 71, 72, 73, 74.

Shell slender, cylindrical, the upper whorls tapering slightly to the wide truncation; dull purplish, fading above. Surface lustreless, sculptured with strong, whitish, thread-like, slightly oblique and arcuate rib-striæ, separated by intervals of more than double their own width. Whorls convex, the last shortly free in front, rounded below, with the slightest trace of a basal keel. Aperture subcircular, a trifle longer than wide, dark purple-brown within. Peristome white, narrowly expanded; columella with a distinct fold within. Axis encircled by three lamellæ, the upper one very small, the lower stronger, denticulate, extending nearly to the aperture, the others disappearing in the penult. whorl.

Length 19.5, diam. 3.4 mm.; whorls 11.

Length 17.5, diam. 3.8 mm.; whorls 9.

Length 19-20, diam. 4 mm.; whorls 12 (*Pfr.*).

Western Cuba: Guira de Luis Lazo, in the jurisdiction of Pinar del Rio (Chas. Wright).

Cyl. trilamellata Pfr., Malak. Bl., xi, 1864, p. 128; Novit. Conch., p. 260, pl. 65, f. 13-15; Monogr., vi, p. 368.—Arango, Contrib., p. 111.

This species stands very near *U. violacea,* differing chiefly in the structure of the axis. It is also somewhat related to *U. vignalensis,* but much more slender and less tapering above. There is but little variation in the 20 specimens before me.

140. U. nubila (Poey). Pl. 57, fig. 40.

Shell elongate, cylindrical, thin, but little shining, brown, sparsely marked with transverse lines; striate-plicate, the plicæ arcuate; spire truncate, 10 slightly convex whorls remaining, the last whorl free near the contiguous whorl, subcarinate beneath; suture simple or sometimes very obsoletely crenulate. Aperture vertical, suboval (narrower behind); peristome simple, narrowly expanded. Axis spirally two-lamellate. Length 20, diam. 5 mm. (*Poey*).

Western Cuba: Paso Real, near Guane, prov. Pinar del Rio, on stones (Poey).

Cyl. nubila Poey, Memorias, ii, p. 38, no. 44, pl. 1, f. 25.—Pfr., Mal. Bl., v, 1858, p. 8; Monogr., iv, p. 700.—Arango, Contrib., p. 112.

Very near *U. violacea* apparently, but the aperture is more pear-shaped, and the axis bilamellate. It is wider than the bilamellate *U. plumbea.* Poey mentions a form 4 mm. in diam.

141. U. violacea ('Wright' Pfr.). Pl. 57, figs. 32, 33, 34, 35.

Shell subcylindric or somewhat fusiform, the upper third tapering to a rather narrow truncation; somewhat solid, purplish-brown. Surface lustreless, sculptured with narrow, widely spaced whitish riblets, which are crowded a little closer just behind the peristome. Whorls convex, the last shortly free in front. Aperture rounded, pear-shaped, subvertical, purplish-brown inside, the expanded lip whitish. Axis encircled by one thin sub-basal lamella (denticulate above), and two hardly noticeable spiral cords above it, obsolete in the last two whorls.

Length 18, diam. 4 mm.; whorls 10½ (Vinales).

Length 19, diam. 4.5 mm.; whorls 10-12 (Pfr., types).

Western Cuba: Isabel Maria, in district Pinar del Rio, prov. P. del R. (Wright); Vinales (R. Arango).

Cyl. violacea Wright mss., Pfr., Malak. Bl., xi, 1864, p. 128; Monogr., vi, p. 367; Novit. Conch., p. 260, pl. 65, f. 10-12.—Arango, Contrib., p. 110.—Sowerby, Conch. Icon., xx, pl. 7, f. 60.

Externally *U. violacea* is very like *U. trilamellata,* but the pillar has only one well-developed lamella, the others being very indistinct. The length of the neck varies a good deal. Figs. 34, 35 are copied from Pfeiffer's; fig. 33 is from a topotype; fig. 32 from a Vinales specimen.

142. U. plumbea ('Wright' Pfr.). Pl. 57, figs. 36, 37, 38, 39.

Shell slender, pillar-shaped, narrowly truncate, moderately solid, purple-brown. Surface lustreless, sculptured with oblique, arcuate, rather widely-spaced whitish riblets, generally a little more spaced on the neck. Whorls convex, especially the later ones; the last whorl free, the neck usually long, sometimes rather short, grooved above. Aperture rounded, dark within, the lip whitish, reflexed. Axis slender, sinuous below, encircled with a thin, sub-basal spiral lamella (denticulate in upper whorls), and a smaller lamella above it, obsolete in the last two whorls.

Length 19, diam. 2.5 mm.; whorls 13.
Length 16, diam. 2.1 mm.; whorls 12½. } Isabel Maria.

Length 17-18, diam. 2.66 mm.; whorls 12 (Pfr., types).

Western Cuba: Isabel Maria, in Pinar del Rio (Wright).

Cyl. plumbea Wright mss., Pfr., Malak. Bl., xi, 1864, p. 129; Monogr., vi, p. 385; Novit. Conch., p. 262, pl. 65, f. 20-22.—Arango, Contrib., p. 125.

Much more slender than *violacea* and *trilamellata. U. macra* is very closely allied, but it is paler, usually retains the apex, and has but one axial lamella.

143. U. macra ('Wright' Pfr.). Pl. 59, figs. 91, 92, 93.

Shell slightly subrimate, cylindric-subulate, rather thin,

somewhat closely arcuately ribbed; corneous-brown, the ribs paler. Spire noticeably attenuated towards the somewhat obtuse apex, entire or shortly truncate; suture deep, nodulose-crenate. Whorls 16-17, convex, the last shortly free, descending, subcylindrical, anteriorly more closely costulate-striate. Aperture a little oblique, piriform-rounded; peristome whitish, narrowly reflexed throughout. Length 16.5 to 18, diam. scarcely 2½ mm. (*Pfr.*).

Western Cuba: Guane, prov. Pinar del Rio (Wright).

Cyl. macra Wr., ARANGO, Repertorio fisico-natural de la isla de Cuba, ii, no. 4, p. 86 (1867); no. 12, p. 270 (1868) nude name; Contrib., p. 126.—*Cyl. macra* Wright, PFR., Malak. Bl., xiv, 1867, p. 210; Monogr., vi, p. 388; Novit. Conch., p. 457, pl. 100, f. 12, 13.

A less robust, paler shell than *U. plumbea,* with the neck much shorter. Figs. 91, 93 of pl. 59 are copied from Pfeiffer's illustration of the type. Fig. 92 is from a specimen from the type locality, measuring 16.5 x 2.3 mm., with 17 whorls. The sutural crenation mentioned by Pfeiffer is rather irregular and inconspicuous in most specimens. The aperture is distinctly longer than wide, but in a front view this is somewhat obscured by foreshortening, owing to its obliquity. The slender axis is sinuous, especially in the later whorls, and is encircled near the base in each whorl by a moderately projecting, thin spiral lamella. The general form is cylindric, the upper third only tapering.

Group of U. pruinosa.

Shell rather large, cylindric, brownish with occasional *white-bordered dark stripes,* the *base carinate;* axis with two equally prominent lamellæ.

144. U. PRUINOSA (Morelet). Pl. 54, figs. 74, 75, 76.

Shell cylindric or column-like, more or less and quite gradually tapering above, rather thin, widely truncate; brownish or purplish corneous, with a wide whitish belt below the suture, and having occasional *white-bordered dark*

vertical stripes. Surface somewhat glossy, arcuately striate, the striæ not half as wide as the intervals. Whorls but slightly convex, the suture seam-like; last whorl free in front, *descending, carinate beneath.* Aperture oblique, wide-ovate, brown inside, the whitish lip expanded, acute. Axis bearing two equally prominent lamellæ, the lower one compressed and minutely denticulate, the upper rather stout and cord-like in the last few whorls, becoming slender above.

Length 24.5, diam. 4.3 mm.; whorls 12.

Length 20.5, diam. 3.2 mm.; whorls 12½.

Length 27, diam. 4.2 mm.; whorls 13.

Isle of Pines, in the mountains (Morelet, Gundlach).

Cyl. pruinosa Morel., Testacea Noviss., i, p. 11, no. 14 (1849).—Desh. in Fér., Hist., ii, p. 228, pl. 164, f. 19-22.—Bland, Ann. Lyc. Nat. Hist. of N. Y., vi, p. 151, pl. 5, f. 17 (axis).—Pfr., Monogr., iii, p. 571; iv, 700; vi, 370; Conchyl. Cab., p. 39, pl. 4, f. 37-39.—Sowerby, C. Icon., xx, pl. 4, f. 31.—Arango, Contrib., p. 112.

Very distinct by its coloration of white and dark stripes, with more or less white frosted over a light purplish-brown ground-color, somewhat like the bloom on a plum; hence the specific name. The basal keel is also a very unusual character in *Gongylostoma.*

Group of U. ventricosa.

Rather short, cylindric or oblong, copiously variegated with white on a corneous ground, nearly smooth, the suture not crenate, the last whorl very shortly free. Axis stout, with a sub-basal denticulate spiral lamella and a low more oblique cord above it.

Differs from the group of *U. coerulans* by its stout axis and plain suture. The single species is from eastern Cuba.

145. U. ventricosa ('Gundl.' Pfr.). Pl. 58, figs. 56, 59, 60.

Shell shortly rimate, swollen-cylindric, smooth, beautifully variegated with milk-white and corneous flames. Spire long, more or less swollen, tapering above, truncate. Whorls re-

maining 10-13, the upper ones flat, lower convex, the last whorl shortly free, rib-striate anteriorly, the base with a thread-like keel. Aperture a little oblique, subcircular, the peristome continuous, narrowly reflexed throughout. Length 15-17, diam. 4-4.5 mm.; diam. of aperture 2.66 mm. (*Pfr.*).

Eastern Cuba: Manzanillo; Bayamo (Gundlach).

Cyl. ventricosa Gundl. mss., Pfr., Malak. Bl., iv, 1857, p. 175, no. 7; Monogr., iv, p. 693; Novit. Conch., p. 250, pl. 63, f. 22-25; Monogr., vi, p. 362, var. *abbreviata*.—Arango, Contrib., p. 107.—Sowerby, C. Icon., xx, pl. 3, f. 17.—*C. abnormis* Gundl., Poey, Memorias, ii, pp. 61, 92 (no description).

Distinguished by the white and corneous-brown marbled coloration and smooth surface, the tendency to be inflated above the middle, and the rather stout axis, which has one compressed lamella, weakly denticulate above, with a low spiral swelling or cord above it. Under a strong lens the upper half of the shell is seen to be densely sculptured with extremely fine, straight striæ.

Pfeiffer's original description is given above, and his figures copied, pl. 58, figs. 59, 60. More slender forms also occur at Manzanillo, pl. 58, fig. 56, measuring, length 13.5, diam. 3.6 mm.; whorls 9½, or a little smaller.

Var. *abnormis* ('Gundl.'). Pl. 58, figs. 57, 58.

Shell short and obese, the spire *much swollen above the middle,* then *rapidly tapering* to the truncation; the rejected portion being slender, as in typical *ventricosa.* Other characters as in *ventricosa.*

Length 11, diam. 5 mm.; whorls 7.

Length 12, diam. 5 mm.; whorls 8.

Length 11.7, diam. 4 mm.; whorls 10 (8 to the plug).

This form also occurs at Manzanillo. Sometimes some of the whorls overhang at the sutures; and there is usually a whorl or more of the empty, subcylindric adolescent shell retained above the plug. Sowerby's figure of *ventricosa* represents this variety. Var. *abbreviata* Pfr. (not of Deshayes) is a synonym.

Group of U. wrighti.

Long and *very slender,* fusiform shells, the diam. contained 5 to 9 times in the length; narrowly truncate, variegated white and corneous, the last whorl free and descending in a long neck (except in *U. contentiosa,* which probably is not closely related to the other species). Axis with a single, more or less spinose spiral thread. Central and eastern Cuba.

The dentition of *U. wrighti* (pl. 61, fig. 12) is notable for the rapid decrease of the teeth in size towards the edges. The decrease is gradual and the teeth normal in form, formula 9.1.9. In *U. baculum* (pl. 60, fig. 11) the radula is narrower, 7.1.7, or rather 5.2.1.2.5, the two inner laterals on each side being distinctly larger than the third, as in the west Cuban group *Tetrentodon.*

I. Last whorl adnate; suture subcrenulate; length 14 to 16, diam. 3 mm., with 14-15 whorls. *U. contentiosa,* no. 151.

II. Last whorl descending in a rather long neck.

1. Whitish with sparse corneous streaks; oblique thread-like riblets separated by spaces 2 or 3 times their width; neck rather long; 12 to 14 x 2 mm., with 13½ to 15 whorls. *U. hilleri,* no. 146.
2. Brownish-corneous with white or corneous, oblique, more widely spaced riblets; neck long; 16.3 to 20 x 2 to 2.2 mm., with 15½ to 20 whorls. *U. wrighti,* no. 147.
3. Creamy or pink, with sparse dark-corneous lunate streaks; rather weak wide-spaced arcuate riblets; neck long; 11.7 to 14 x 1.7-1.9 mm., whorls 14 to 17. *U. baculum,* no. 148.
4. Diaphanous, whitish, obliquely ribbed; 15 to 17 x 2.5 mm., whorls 15 to 17. *U. lajoncherei,* no. 150.
5. Brownish-corneous, glossy, closely striate near the sutures, smoother in the middle of each whorl; length 11.7 to 17, diam. 2.2 to 3 mm., with 11 to 13 whorls. *U. producta,* no. 149.

146. U. HILLERI (Pfeiffer). Pl. 59, figs. 77, 78.

Shell very slender, fusiform, widest in the middle, slowly

tapering to a narrow truncation above; *whitish with irregularly spaced, wedge-shaped, curved corneous streaks.* Surface slightly shining, sculptured with *oblique, thread-like white riblets* separated by intervals two or three times their width. Whorls convex, the last free, descending in a rather long neck. Aperture oblique, circular, the peristome expanded and subreflexed throughout. Axis slender, slightly sinuous, being encircled by a low spiral thread near the base in each whorl.

Length 12, diam. 2 mm.; whorls 13½.

Length 13, diam. 2.1 mm.; whorls 13½.

Length 12-14, diam. 2 mm.; whorls 15 (Pfr., type).

Cyl. hilleri Pfr., Malak. Bl., ix, 1862, p. 132; Monogr., vi, p. 387; Novit. Conch., p. 457, pl. 100, f. 14-16.—Arango, Contrib., p. 125.

Eastern Cuba: Picote (Jeanneret), and Sagua de Tanamo (Wright), in Mayari.

"In color and sculpture this species stands nearest to *U. wrighti,* but is much more slender, somewhat like *U. porrecta* in form, truncate, the whorls are flatter and much more closely striate, and the striation continues even to the aperture, while in *rageli* it is stronger and more widely spaced on the neck" (*Pfr.*). *U. hilleri* is smaller, more closely striate and less lengthened than *U. wrighti.*

147. U. wrighti (Pfeiffer). Pl. 59, figs. 83, 84, 85, 86.

Shell very slenderly fusiform, the middle third nearly cylindric, the ends slowly tapering; narrowly truncate; thin; brownish-corneous with some white streaks, or whitish with corneous markings. Surface glossy, sculptured with low, narrow whitish, *widely-spaced riblets,* which are oblique and arcuate. Whorls moderately convex, the last free in a long, descending, forwardly curved neck. Aperture subcircular, the peristome evenly expanded, somewhat reflexed throughout. Axis slender, somewhat sinuous, encircled by a low thread below, which in the median and upper whorls is a little stronger, and bears delicate filament-like spines.

Length 20, diam. 2 mm.; whorls 20.

Length 16.3, diam. 2 mm.; whorls 15½.

Length 20, diam. 2.25 mm.; whorls 18 (Pfr., type).

Eastern Cuba: Cayo del Rey, Mayari (Wright, Jeanneret).

Cyl. wrighti Pfr., Malak. Bl., ix, 1862, p. 132; Monogr., vi, p. 387; Novit. Conch., p. 456, pl. 100, f. 10, 11.—Arango, Contrib., p. 126.—Sowerby, C. Icon., xx, pl. 10, f. 85.

More lengthened than *hilleri,* with wide-spaced riblets and more whorls. Pfeiffer found 26 in a specimen retaining the spire complete.

148. U. baculum Pilsbry, n. sp. Pl. 59, figs. 87, 88, 89, 90.

Shell very slenderly fusiform, tapering to a narrow truncation, thin, opaque, somewhat glossy; cream colored or pale pink, with scattered dark corneous lunate streaks, each bordered on the right side with an opaque white patch. Surface sculptured with rather weak, wide-spaced, arcuate and oblique riblets, stronger on the last whorl. Whorls convex, the last free, produced downward and forward in a long, spirally curved neck. Aperture oblique, circular, the peristome rather widely expanded and reflexed. Axis as in *U. wrighti,* the single lamella delicately serrate in the upper whorls. Radula with 7.1.7 teeth (pl. 60, fig. 11), the two inner lateral teeth on each side large, the rest decidedly smaller.

Length 14.8, diam. 1.9 mm.; whorls 17.

Length 11.5, diam. 1.7 mm.; whorls 14.

Length 11.7, diam. 1.9 mm.; whorls 14.

Cuba (T. Bland, in Swift. coll., types no. 71553 A. N. S. P.).

Smaller and more fusiform than *U. wrighti* (which it resembles in sculpture), and having a longer, more sinuous neck. *U. hilleri* is more strongly and more closely striate. The whorls are more convex than in *U. porrecta.* It may be near *cinerea* Pfr., but has more whorls in the same length.

149. U. producta ('Gundlach' Pfr.). Pl. 58, figs. 61, 62, 63, 64.

Shell slender, cylindric, the upper half slowly tapering, summit truncate; thin, brownish-corneous, with a gloss as if

oiled. Surface nearly smooth on the convexity of each whorl, closely striate near the sutures, the last whorl usually with some irregularly and widely spaced rib-striæ, prominent where they pass upon the base. Whorls convex, the last shortly free, with a weak basal keel, almost obsolete in the smoother shells. Aperture quite oblique, rounded, longer than wide, the peristome white, expanded and thickened. Axis slender, sinuous in the last two whorls, above which it is encircled by a low and slender, inconspicuous spiral thread, which is minutely asperate in some whorls.

Length 16, diam. 2.5 mm.; whorls 12½.

Length 11.7, diam. 2.2 mm.; whorls 11.

Length 17, diam. 3 mm.; whorls 12 to 13 (Pfr., types).

Central Cuba: Mt. San Juan de Letran, and other places in the Trinidad cordillera (Gundlach).

Cyl. producta Gundl. mss., Pfr., Malak. Bl., iv, 1857, p. 110, no. 22; Monogr., iv, p. 693; Conchyl. Cab., p. 18, pl. 9, f. 26-30.—Sowerby, C. Icon., xx, pl. 10, f. 89.—Arango, Contrib., p. 107.

Distinguished from other slender east Cuban forms by the uniform corneous-brown color.

150. U. LAJONCHEREI (Arango).

Shell long-fusiform, slender, subtruncate, thin, somewhat obliquely ribbed, diaphanous, whitish. Whorls remaining 15-17, the last free, stretched downward; suture simple. Aperture oblique, circular, the peristome shortly expanded throughout. Length 15-17, diam. 2.5 mm. Internal column thread-twisted (*Arango*).

Central Cuba: San Juan de las Lleras, near Villaclara.

Cyl. lajoncherei Arango, Proc. Acad. N. S. Phila. 1884, p. 212 (Nov. 4, 1884).

Similar to *C. philippiana,* but longer, with more remote ribs, and whitish in color, instead of being variegated with brown (*Arango*).

151. U. CONTENTIOSA (Arango).

Shell slightly rimate, fusiform-turrete, brownish corneous,

sparingly variegated with a paler tint. Spire noticeably tapering above, truncate, the suture subcrenulate. Whorls remaining 14-15, flattened, the last adnate, with a thread-like basal keel. Aperture subcircular, the peristome equally expanded throughout, white. Internal column encircled by a single acute, oblique lamina. Length 14-16, diam 3 mm. (*Arango*).

Central Cuba: San Juan de las Lleras, near Villaclara.

C. contentiosa Arango, Proc. A. N. S. Phila. 1884, p. 211 (Nov. 4, 1884).

The position of this species in the series is uncertain.

Section *Tetrentodon* Pilsbry, 1903.

Trachelia Pfr. (in part), Monogr. Helic. Viv., iii, p. 564 (1853), proposed for *marmorata* Shutt., *volubilis* Morel., *porrecta* Gld., *gracillima* Poey, *speluncæ* Pfr., *subtilis,* Morel., *gouldiana* Pfr., *rugeli* Shutt., *riisei* Pfr., *cinerea* Pfr., *morini* Morel., *philippiana* Pfr., *scalarina* Shutt. Name preoccupied by Scopoli in Aves, 1777, by Serv. in Coleoptera, 1834, and by Westwood in Coleoptera, 1839.

Shell attenuate, entire or shortly truncate, the neck cylindric, rounded beneath; axis very weakly one- or two-plicate, *the spirals not crenulate;* apex swollen, smooth. Radula narrow, with 13 to 19 teeth in a transverse row, the inner two laterals on each side much larger than the succeeding teeth. Type *U. plicata* (Poey).

A group of slender-shelled Cylindrellas, found in the provinces of Matanzas and Havana, with a single species in New Providence, Bahamas. The series is related on one hand to *Cochlodinella,* from which it differs in the more or less plicate axis, and on the other to the very slender forms of *Tomelasmus,* of the group of *U. wrighti,* in which, however, the axis has a spinose lamella in the upper whorls.

The species of *Tetrentodon* were referred to the genus *Brachypodella* in my paper of 1898, but having examined the teeth of most of them, I find that the affinities of the group are wholly with the west Cuban forms of *Urocoptis.* The dentition (pl. 43, fig. 3, *U. cyclostoma;* fig. 4, *U. plicata;*

fig. 5, *U. scalarina*) is chiefly notable for the great *reduction in the number of teeth* in a transverse row, and the *degeneration of all but the inner two lateral teeth* on each side. The radula is in process of specialization exactly parallel to that of *Brachypodella,* toward a form in which *the inner four lateral teeth alone are functional;* but the result cannot be exactly the same because in *Tetrentodon* this specialization is superposed upon a phylum having teeth already diversely specialized from the ancestral stock whence *Brachypodella* and *Urocoptis* arose. It should be noted also that this group, parallel to *Brachypodella* in both shell and dentition, arose in an area where *Brachypodella* does not exist.

The shape and structure of the cusps of the individual teeth are exactly as in *Cochlodinella* and *Gongylostoma;* but in some species the posterior angles of the basal-plates (lower angles, as figured) are strongly thickened. This is well shown in fig. 5, representing a central and an inner lateral tooth of *U. scalarina* in profile, the two posterior-lateral processes of the central tooth projecting at the lower left side of the figure, while the thickened outer angle of the lateral tooth projects like a cusp, below on the right. I have examined the teeth of *U. cyclostoma, scxdecimalis, camoensis, marmorata, plicata bahamensis* and *scalarina.*

Key to Species.

I. Length 16 to 28, diam. 1.6 to 2 mm., with 17 or more whorls in truncate specimens; cylindric-tapering; corneous, usually more or less clouded with white; neck long.

1. Lustreless, nearly smooth in the middle, weakly costulate above and below; whorls flattened. 21 to 28 x 2 mm., with 26-28 whorls.

U. gracillima, no. 152.

2. Lustreless, with oblique wide-spaced riblets; 18 x 1.6 mm., with 20½ whorls, truncate, to 20 x 2 mm., with 29 whorls in entire shells.

U. cyclostoma, no. 153.

3. Slightly glossy, smooth or weakly striate; whorls

convex; 17.5 to 21 x 2 mm., with 17-25½ whorls in truncate shells. *U. ischna,* no. 154.

4. Smooth, often faintly tessellate with opaque white; whorls but slightly convex; 13-15 x 1.7-2 mm., with 19-24 whorls in entire shells. *U. porrecta,* no. 155.

II. Smaller, 12 x 3 mm.; brown with a red-gold gleam, and snow-white, straight ribs; whorls 13 in entire, 10 in truncate shells. *U. blainiana,* no. 166.

III. Small, length 14 mm. or less, not sculptured like II.

1. Smooth or nearly so.

a. Smooth, glossy, corneous marbled with white, aperture brown inside; 10-11 x 1.6 mm., whorls 16-18. *U. sexdecimalis,* no. 157.

b. Similar, blue-white streaked with corneous; 11 x nearly 2 mm., whorls 16. *U. clerchi,* no. 158.

c. Corneous with some white lines and spots; irregular, narrow, thread-like riblets; 12 x 1.6 to 2 mm., whorls 20. *U. camoensis,* no. 159.

d. Opaque fleshy-white, with wedge-shaped corneous-brown stripes; glossy and smooth; 9.5 x 1.7 to 2 mm., 13½ to 14 whorls. *U. marmorata,* no. 160.

2. Shell ribbed.

a. Subarcuately costulate, ashen with chestnut aperture; whorls flattened; 14 x 2.6 mm., truncate with 12 whorls. *U. cinerea,* no. 156.

b. Corneous with some white lines and spots; irregular thread-like riblets; 12 x 1.6 to 2 mm., with 20 whorls. *U. camoensis,* no. 159.

c. Fusiform, swollen in the middle; flesh-tinted with some pale brown markings; delicately costulate; 9.5 x 1.6 mm., whorls 14, entire. *U. rugeli,* no. 161.

d. Similar but stronger ribbed; 9.5 x 2 mm., with 11 whorls, truncate *U. r. euglypta,* no. 161a.

e. Obliquely sharply striate; corneous-whitish obsoletely variegated with brownish; 12.5 x 2.6

mm., with 12 to 15 whorls in truncate, 18 to 19 in entire shells. *U. philippiana,* no. 162.

f. Lamella-ribbed, lustreless, with very convex whorls; 12.3 x 2.2 mm., with 17 whorls, to 8.7 x 1.7 mm., with 15 whorls. *U. plicata,* no. 163.

g. Fusiform, lustreless, with strongly elevated, subvertical lamellæ; 9 to 10 x 2.2 mm., with 10 whorls in truncate to 17 in entire specimens. *U. scalarina,* no. 164.

h. Ribbed; New Providence, Bahamas. *U. bahamensis,* no. 165.

152. U. GRACILLIMA (Poey). Pl. 62, figs. 41, 42.

Shell *cylindric*-subulate, very slender, the upper third tapering, attenuate, the apex truncate; thin, corneous clouded with white, but usually appearing tawny from adherent soil. Surface *lustreless,* under a lens seen to be obliquely weakly costulate above and on the last two whorls, the intermediate whorls nearly smooth. Whorls nearly flat, the last descending and projecting in a long free neck, which is sculptured with narrow, widely spaced riblets. Aperture oblique, circular, the peristome free, wide and flatly reflexed. Axis slender, slightly sinuous within each whorl (pl. 64, fig. 13).

Length 21, diam. 2 mm.; whorls 26 (apex truncate).

Length 28, diam. 2 mm.; whorls 28-30, of which 8 or 9 are generally deciduous (Poey).

Western Cuba: San Jose de las Lajas (Don Ignacio Hernandez).

Cyl. gracillima POEY, Memorias, i, pp. 202, 211, pl. 12, f. 1-3 (May, 1853, t. c., p. 449).—PFR., Monogr., iii, p. 576; iv, 707; vi, 385; Malak. Bl., 1854, p. 212; Conchyl. Cab., p. 54, pl. 6, f. 4-6.—ARANGO, Contrib., p. 125.—SOWERBY, C. Icon., xx, pl. 15, f. 130.

This very slender species resembles *U. cyclostoma* Pfr., but differs by its nearly smooth surface, only the neck being strongly costulate.

153. U. CYCLOSTOMA (Pfeiffer). Pl. 62, figs. 38, 39, 40.

Shell cylindric-subulate or fusiform-subulate, attenuate above, the apex entire and bulging, or narrowly truncate; thin; corneous, usually with a rusty extraneous coat. Surface lustreless, sculptured with *narrow, oblique, thread-like riblets, parted by spaces four or five times their width.* Whorls slightly convex, the last descending and projecting in a rather long neck. Aperture oblique, circular, the peristome white, expanded and flatly reflexed. Axis rather stout for so slender a shell, cylindrical.

Length 19.5, diam. 1.8 mm.; whorls 29 (apex entire).

Length 18.6, diam. 1.6 mm.; whorls 20½ (truncate).

Length 20, diam. 2 mm.; whorls 26-29 (Pfr.).

Western Cuba: Lomas de Camoa (Gundlach); Cuevas de Cotilla (Arango).

Cyl. cyclostoma PFR., Malak. Bl., ii, 1855, p. 100, pl. 5, f. 6, 7; Conchyl. Cab., p. 54, pl. 6, f. 7-9; Monogr., iv, p. 708. —ARANGO, Contrib., p. 125.—GUNDLACH, Malak. Bl., iv, 1857, p. 47.—W. G. BINNEY, Ann. N. Y. Acad. Sci., iii, p. 125 (teeth).

Near *U. gracillima,* but more strongly sculptured, with the whorls somewhat more convex, and the spire more tapering. Binney found the tooth-formula to be 8.2.1.2.8. In the radula I examined there are 5.2.1.2.5 teeth (pl. 43, fig. 3, 6th lateral in profile), the inner two laterals equal and much larger than the others.

154. U. ISCHNA Pilsbry, n. sp. Pl. 64, figs. 9, 10, 11.

Shell cylindric-tapering, very slender, the summit narrowly truncate; thin; brownish-corneous, sparsely and indistinctly marbled with whitish, or whitish with some brown markings. Surface slightly shining, *smooth,* or with some weak striation. Whorls convex, the last descending in a rather long round neck. Aperture circular, oblique, the peristome white and well expanded. Axis slender and straight, encircled by two low spirals (fig. 10).

Length 21, diam. 1.9 mm.; whorls 25½.

Length 17.5, diam. 2 mm.; whorls 17.

Western Cuba: Camoa (Arango).

Similar to *U. cyclostoma* in shape, but differing by the smooth or nearly smooth exterior and the biplicate axis. In *U. gracillima* the cylinder is wider above, the whorls are conspicuously flatter, and the neck is longer and strongly sculptured.

155. U. PORRECTA (Gould). Pl. 62, figs. 26, 27, 28.

"Shell very slender and delicate, fusiform, translucent, somewhat enlarged at the tip. Surface faintly tessellated with subquadrate spots of opaque white. Whorls about 24, about 8 of which are usually broken from the summit; the others are very slightly convex, smooth; the last whorl is disjoined from the penultimate, and stretched out so as to take nearly the direction of the axis of the shell, and to bring the plane of the aperture nearly at right angles with it; this last whorl is also covered with minute, close-set ribs. Aperture circular, with the peristome broadly and roundly everted. Length three-fifths inch, breadth seven-hundredths inch" (*Gld.*).

Western Cuba: Retiro, a coffee estate in the district of Sumidero, near Coliseo, 20 or 25 miles s.-e. of Matanzas (Bartlett); Limonar and Caobas, near Matanzas (Gundlach).

Pupa (*Siphonostoma*) *porrecta* GLD., Boston Journ. of Nat. Hist., iv, p. 490, pl. 24, f. 12 (1844).—*Cylindrella porrecta* Gld., PFR., in Philippi, Abbild., ii, p. 50, pl. 2, f. 10; Monogr., ii, p. 372; iii, 576; iv, 707; vi, 384; Conchyl. Cab., p. 53, pl. 6, f. 1-3.—SOWERBY, C. Icon., xx, pl. 11, f. 100.—ARANGO, Contrib., p. 123.

Gould's very good description is given above. Specimens with the apex entire have from 19 to 24 whorls. Often some of the earlier ones are deciduous, as in fig. 28. The last whorl has a more or less distinct but wide and obtuse basal keel, above which it is noticeably contracted. In one of the specimens I received from Gould (fig. 28) this is especially well developed. The last whorl may be either very delicately rib-striate, or somewhat coarsely so. The axis is slender and simple. In some specimens the opaque white spots are faint

or wanting; in others they seem diffused, the whole surface being whitish. Specimens measure, length 13, diam. 1.7 to 2 mm.

156. U. CINEREA (Pfeiffer). Pl. 65, figs. 11, 12.

Shell not rimate, slender, cylindric-subulate, truncate; obliquely subarcuately costulate, the riblets stronger and rather flat on the lower whorls; opaque, ashen. Whorls remaining 12, flattened, the last free, descending, subsulcate above, the base obsoletely carinate. Aperture circular, glossy chestnut colored inside; peristome continuous, white, acute, narrowly expanded. Length 14, diam. below the middle 2.66, diam. of aperture nearly 2 mm. (*Pfr.*).

Cuba.

Cyl. cinerea PFR., Zeitschr. f. Malak., 1850, p. 75; Conchyl. Cab., p. 52, pl. 5, f. 39, 40; Monogr., iii, p. 578.

Known by the original figures and description only. It seems to be a wider shell than *U. baculum.*

157. U. SEXDECIMALIS ('Jim.' Pfr.). Pl. 62, figs. 36, 37.

Shell fusiform-subulate, thin, smooth, pellucid, glossy; marbled with white on a corneous ground, or with corneous on white. The spire is very slender above, but enlarged at the tip, the greatest width being below the middle. Whorls but slightly convex, the last becoming free, cylindric and descending, the neck round below, and rib-striate on the back. Aperture circular, oblique, brownish inside, the white lip evenly reflexed. Axis slender, simple and straight.

Length 10, diam. 1.6 mm.; whorls 17½.

Length 11, diam. 1.66 mm.; whorls 16-18 (type).

Western Cuba: Estate Fumero, at Vieja Bermeja, dist. of Cabezas (Jimeno), and coffee plantation of San Luis, at Jaruco (Arango), both in Havana province.

Cyl. sexdecimalis Jimeno mss., teste Gundlach in litt., PFR., Malak. Bl., xi, 1863, p. 9; Monogr., vi, p. 384.—ARANGO, Contrib., p. 123.—SOWERBY, C. Icon., xx, pl. 15, f. 128.

Very near *porrecta,* but smaller and composed of fewer whorls. The aperture is sometimes carried laterally further than in the specimen figured, which was received from Jimeno.

The figure is somewhat faulty in the shape of the spire, which should be attenuated above for a greater distance. Some specimens are shortly truncate, then having, of course, fewer whorls than the number given above for entire shells.

The dentition is 7.2.1.2.7, but the three outer laterals have no cutting points, as in *plicata,* which it resembles.

158. U. CLERCHI ('Arango' Pfr.).

Shell fusiform-subulate, thin, nearly smooth, glossy, blue-whitish streaked with corneous. Spire slender, the apex subacute. Whorls about 16, convex, the upper irregularly marked with a few riblets, the median whorls smooth, last whorl free, pulled out in a rather long neck, sculptured with compressed, acutely elevated, less close ribs. Aperture oblique, subcircular, the peristome continuous, equally and rather widely expanded throughout. Length 11, diam. nearly 2 mm.; diam. aperture 2 mm. (*Pfr.*).

Western Cuba: Sitio Perdido, at Jaruco, prov. of Havana (Clerch).

Cyl. clerchi Arango mss., PFR., Malak Bl., xvii, 1870, p. 91; Monogr., viii, p. 443.—ARANGO, Contrib., p. 124.

"Very closely related to *C. sexdecimalis* Jim., but differing by the convex whorls more broadly expanded peristome, and especially the lamelliform ribs of the free part of the last whorl" (*Pfr.*). The internal column is simple, according to Arango.

159. U. CAMOENSIS (Pfeiffer). Pl. 62, figs. 43, 44, 45.

Shell fusiform-subulate, the upper half strongly attenuate to the bulbous apex, lower half somewhat cylindric; thin, corneous with some white lines and spots. Surface hardly glossy, irregularly sculptured with narrow, thread-like riblets, separated by much wider intervals. Whorls somewhat convex, the last descending in a rather short, round neck. Aperture somewhat oblique, circular, the peristome evenly expanded. Axis slender and straight, but with a perceptible spiral twist.

Length 12.2, diam. 1.6 mm.; whorls 20.

Length 12, diam. hardly 2 mm.; whorls 20-21. (Pfr.).

Western Cuba: Camoa, Havana province (Gundlach).

Cyl. camoensis Pfr., Malak. Bl., ii, 1855, p. 100, pl. 5, f. 8, 9; Conchyl. Cab., p. 52, pl. 5, f. 36-38; Monogr., iv, p. 709. —Gundlach, Malak. Bl., iv, 1857, p. 47 (coloration of soft parts).—Sowerby, C. Icon., xx, pl. 16, f. 139.—Arango, Contrib., p. 127.—*Cyl. modesta* Poey, Memorias, ii, p. 93 (as var. of *C. camoensis*).

A small, delicately ribbed shell, the upper half much attenuated. The sculpture varies a good deal, the riblets sometimes being irregular and partially obsolete.

Dentition 4.2.1.2.4 or 5.2.1.2.5, the teeth as in *U. plicata.*

159 a. Var. *modesta* Poey. Pl. 62, figs. 34, 35.

Riblets obsolete or nearly so, the surface comparatively smooth. The figure is from a shell which has lost the early whorls, hence is more shortly attenuate than entire specimens. Pan de Matanzas. A Matanzas specimen from Poey, with others before me, supports the view that *modesta* is a mere variety of *camoensis.*

160. U. marmorata (Shuttleworth). Pl. 62, figs. 29, 30, 31.

Shell small, slender, fusiform, *opaque fleshy-white variegated with wedge-shaped corneous-brown stripes.* Surface glossy, smooth. Spire attenuate, entire or narrowly truncate. Whorls convex, the last half of the last one free and descending, rounded below. Aperture oblique, circular, the white peristome reflexed. Axis slightly sinuous.

Length 9.5, diam. 1.7 mm.; whorls 13½.

Length 9.5, diam. nearly 2 mm.; whorls 14 (Shuttlw.).

Western Cuba: Valley of the Yumuri, Matanzas (Rugel).

Cyl. marmorata Shuttl., Bern Mittheil., 1852, p. 277, and separate copy, Diagnosen neuer Mollusken no. 3, p. 37.—Pfr., Malak. Bl., 1854, p. 211; Monogr., iii, p. 576.—Arango, Contrib., p. 123.—*C. marmorata* Pfr., Conchyl. Cab., p. 55, pl. 6, f. 10-12.

A very distinct little shell, shorter than the related mottled species, though the neck is sometimes a little longer than in the shells figured. The teeth are as in *camoensis,* but there are one or two more laterals, formula 5 or 6.2.1.

161. U. RUGELI (Shuttleworth). Pl. 65, figs. 9, 10.

"Shell slender, entire, fusiform, swollen in the middle, strongly and rapidly tapering above, delicately and remotely rib-striate; dull flesh colored, marbled here and there with pale brownish streaks. Apex papillar. Whorls 14, a little convex, the last disjoined, stretching downwards a long distance, slightly angulate. Aperture oblique, subcircular; peristome narrowly reflexed. Alt. 9.5, diam. 1.66 mm." (*Shuttl.*).

Western Cuba: Yumuri Valley, near Matanzas (Rugel); Pan and Palenque de Matanzas (Gundlach), and var. *brevicollis* at the plantation San Luis, in Jaruco, Prov. Havana (Arango).

Cyl. rugeli SHUTTLW., Bern, Mittheil, 1852, p. 297; PFR., Monogr., iii, p. 578; iv, 708; vi, 387; Conchyl. Cab., p. 56, pl. 6, f. 13-15.—ARANGO, Contrib., p. 125.—*C. rugeliana* POEY, Memorias, i, p. 397.—SOWERBY, C. Icon., xx, pl. 16, f. 142.—*C. rugeli* var. *brevicollis* PFR., Nomencl. Hel. Viv., p. 281 (1878).

A small, fusiform shell, quite delicately costulate, with the lip narrowly expanded, and the axis encircled by a small spiral cord. *U. marmorata* is closely related, but is smooth. *U. plicata* has a much more strongly ribbed shell.

161 a. Var. EUGLYPTA Pilsbry, n. v. Pl. 64, fig. 4.

Similar to *U. rugeli* in contour, but evenly sculptured with narrow but well-raised riblets, hardly coarser or more spaced on the last whorl. Marbled white and brown, like the typical form. Length 9½, diam. 2 mm., whorls 11, the apex being truncate.

161 b. Var. BREVICOLLIS Pfr.

This variety was proposed for specimens from Jaruco, and has not been defined. From the name, it has apparently a shorter neck than *rugeli*.

162. U. PHILIPPIANA (Pfeiffer). Pl. 65, figs. 1, 2, 14, 15, 16.

"Shell lengthened-fusiform, slender, subtruncate, thin, somewhat obliquely sharply striate, diaphanous, corneous-

whitish obsoletely variegated with brownish. Spire very much attenuated. Whorls 12 to 15, convex, the last free, prolonged downward, cylindrical. Aperture oblique, round; peristome shortly expanded throughout. Length 6¼, diam. 1⅓ lines [12.5 x 2.6 mm.] (*Pfr.*).

Cuba (Pfr.): San Jose de las Lajas, in prov. of Havana (Arango); between the Tetas de Managua and San Jose de las Lajas (Poey).

Cyl. philippiana Pfr., in Philippi, Abbild., ii, p. 50, pl. 2, f. 12 (Oct., 1845); Monogr., ii, p. 378; iii, 579; iv, 709; vi, 388; vii, 445; Conchyl. Cab., p. 50, pl. 5, f. 27-29.—Poey, Memorias, i, p. 203, pl. 12, f. 7-10.—Gundl., Malak. Bl., 1857, p. 47.—Arango, Contrib., p. 126.—Sowerby, C. Icon., xx, pl. 15, f. 132.—*Cyl. aculeus* Morelet, Testac. Noviss., i, p. 12, no. 18 (1849).

Very near *U. plicata,* from which it differs in scarcely anything but the closer ribs. In perfect shells the apex is a little swollen and there are 18 or 19 whorls. The axis is slender and very slightly sinuous. There is great variation in the length of the neck.

Pfeiffer's figures in the *Conchylien Cabinet,* which I have copied, pl. 65, figs. 1, 2, do not seem to my eye very characteristic. The original figures in Philippi's *Abbildungen,* one of which I have copied (fig. 14), are excellent, and agree with numerous specimens before me (f. 15, 16).

C. aculeus Morelet, from the Tetas de Managua, seems to be rightly referred to this species by Pfeiffer, the description scarcely differing except in the number of whorls, Morelet describing an entire, Pfeiffer a truncate individual. "Shell lengthened-fusiform, entire, slender, ribbed with somewhat oblique, distant plicæ, corneous-brown; spire much attenuated, the apex rather obtuse. Whorls 18, convex, the last free, stretched downward, cylindric. Aperture round, the peristome narrowly expanded throughout. Length 12½, diam. 2⅓ mm." (*Morel.*).

163. U. plicata (Poey). Pl. 65, figs. 17, 18.

Shell fusiform-turrete, the lower half somewhat swollen,

the penult. whorl usually widest, above which it tapers regularly, the upper part being much attenuated; the smooth apical whorls being a little swollen when retained. Thin, typically whitish corneous, but varying to golden brown; surface lustreless, sculptured with nearly straight *lamellar ribs, parted by smooth intervals 4 or 5 times their width.* Whorls very convex, the latter half of the last one free, descending and projecting, cylindric. Aperture slightly oblique, nearly circular, the peristome white, broadly reflexed. Axis slender, encircled by a low spiral cord.

Length 12.3, diam. 2.2 mm.; whorls 17.

Length 8.7, diam. 1.7 mm.; whorls 15.

Western Cuba: Lomas de Candela, Guines (Poey); Sabana de Robles (Arango), both in Havana province.

Cyl. plicata Poey, Mem. ii, p. 31, no. 25, pl. 2, f. 9, 10 (1857).—Pfr., Malak. Bl. 1856, p. 225; Monogr., iv, p. 709; vi, p. 388.—Arango, Contrib., p. 127.—Sowerby, C. Icon. xx, pl. 12, f. 105.

Specimens which have lost the apex, have four or five whorls fewer. There is a good deal of variation in the size of the shell, but the lamellar ribs and attenuate spire are characteristic. Sometimes some spiral threads traverse the intervals between the ribs. *U. scalarina* has a more strongly sculptured shell than *plicata,* and *U. blainiana* differs by its larger size, less attenuate spire and dark color. In my opinion *U. plicata* should be ranked as a variety of *U. philippiana,* from which the more distant riblets alone distinguish it; but the differences between the two seem to be covered by intermediate forms in the series before me.

The radula is long and narrow with 7.2.1.2.7 teeth, two or three outer ones on each side with merely a low ledge in place of cusps. The third tooth is abruptly smaller than the second (pl. 43, fig. 4).

Gundlach found *U. plicata* at Santiago, the specimens being quite like those from Guines (see Mal. Blätter v, p. 186). I think they must have been accidentally introduced there.

U. bahamensis may be a colony of this species, imported to New Providence within the historic period, and slightly changed by the new environment of a low islet.

164. U. SCALARINA (Shuttleworth)). Pl. 65, figs. 3, 4.

Shell fusiform-turrete, the lower half subcylindric, upper half strongly tapering, attenuate, the spire either entire or more often narrowly truncate; thin, whitish or brownish corneous. Surface without gloss, sculptured with strongly elevated subvertical lamellæ, which are hollow, and parted by intervals of three or four times their width; these intervals smooth except for several spiral threads, which run up on the anterior face of each lamella. Whorls very convex, separated by a deeply constricting suture, the last whorl becoming free, descending in a short neck. Aperture somewhat oblique, sub-circular, the peristome expanded and flatly reflexed, white. Axis slender, with a very weak spiral trend.

Length 10, diam. 2.2 mm.; whorls 17 (entire).

Length 9, diam. 2.2 mm.; whorls 10 (truncate).

Western Cuba: Yumuri Valley, near Mantanzas (Rugel); Sitio Perdido, in Jaruco, Havana Province (Clerch).

Cyl. scalarina SH., Bern. Mittheil, 1852, p. 297; Diagn. n. Moll. no. 3, p. 37.—PFR., Malak. Bl., 1854, p. 212; Conchyl. Cab., p. 50, pl. 5, f. 30-32; Monogr., iii, p. 479.—ARANGO, Contrib., p. 127.—SOWERBY, C. Icon., xx, p. 9, f. 74.

The ribs in this species are hollow, each being composed of two laminæ, as in *Callonia, Idiostemma,* etc. They are absent from the first six or seven whorls. The shell is usually white with the attenuate spire brown, but sometimes the brown tint extends to the last whorl. The radula has 5.2.1.2.5 teeth, the two inner laterals large, as usual in this group. The posterior angles of the basal-plates are thickened (pl. 43, fig. 5, central and first lateral in profile).

165. U. BAHAMENSIS (Pfeiffer). Pl. 65, figs. 19, 20.

"Shell not rimate, slenderly fusiform, truncate, rather thin, somewhat closely compressed-costate, corneous. Spire noticeably tapering above, truncate, whorls remaining 9, moderately convex, the last free, shortly drawn out, cylindric. Aperture oblique, subcircular; peristome equally and narrowly expanded throughout. Length 8.75, diam. 2.25, diam. apert. 1.5 mm." (*Pfr.*)

Bahamas: Nassau, New Providence (Poey).

Cyl. bahamensis Pfr., Malak. Bl., vii, 1860, p. 214, pl. 2, f. 8-11; Monogr., vi, p. 381.—Crosse & Fischer, Journ. de Conch., 1870, pp. 11, 25 (teeth and jaw).

" Stands nearest to *C. dominicensis,* but is more lengthened, and the last whorl is not compressed " (*Pfr.*).

I have not seen typical *bahamensis,* of which the original description and figures are copied.

Var. *providentia* Pils. n. v. Pl. 65, figs. 21, 22. Many specimens from Nassau before me differ from Pfeiffer's description in being larger, with coarser and more spaced ribs. On the fourth whorl from the base there are 15 to 17 ribs, parted by intervals about three times their width; on the last whorl or two the ribs are more widely spaced. The shell is dull white, opaque, with some indistinct gray mottling. The neck is moderately long; the lip is flatly reflexed and rather wide. The axis is nearly straight. Out of twenty-two specimens, only one retains the apex entire, nearly all being rather widely truncate.

Length 12.5, diam. 2.4 mm.; whorls 19½ (entire).

Length 12, diam. 2.5 mm.; whorls 11.

Length 9.8, diam. 2.3 mm.; whorls 9.

This form is very closely related to *U. plicata* of western Cuba. The Haitian *dominicensis,* with which Pfeiffer compares *bahamensis,* belongs to *Brachypodella.* The radula of var. *providentia* has 5.2.1.2.5 teeth, similar to those of U. *plicata,* but the posterior angles of the basal-plates of the centrals are thickened into bosses, more than in *plicata.* Perhaps *U. bahamensis, Bulimulus sepulcralis* and *Zachrysia provisoria* in New Providence were imported there years ago from Havana, with plants or in some similar manner. I doubt that their presence is due to natural causes.

166. U. blainiana (' Gundl,' Pfr.). Pl. 65, figs. 5, 6, 7, 8.

Shell cylindric-turrete, the upper third or half rapidly tapering to the smooth yellowish apex (which is sometimes deciduous; thin, *dark brown with a gleam of red-gold* in the high-light, sculptured with straight, slightly oblique, *snow-*

white ribs, which are hollow, rounded at their summits, and parted by intervals of double their width. Whorls moderately convex, the latter half of the last free, descending in a round, contracted neck. Aperture slightly oblique, circular, brown, the peristome being rather broadly reflexed, white above, brown below. Axis straight, slender, encircled by a single simple spiral cord, not spinose even in the upper whorls. In some whorls a second very weak cord appears above it (pl. 64, fig. 14).

Length 12, diam. 2.9 mm.; whorls 13 (entire).

Length 12, diam. 3 mm.; whorls 10 (truncate).

Western Cuba: Pan de Guajaybon, Pinar del Rio (Gundlach, Wright).

Cyl. blainiana Gundl. mss., Pfr., Malak. Bl., xi, 1863, p. 13; Novit. Conch., p. 252, pl. 63, f. 30-35; Monogr., vi, p. 379.—Arango, Contrib., p. 119.—*C. scopulosa* Gundl. on labels.—? *C. scopulorum* Gdl., Schaufuss in Paetel's Catal., p. 68.

This species presents the most extraordinary parallelism to *U.* (*Callonia*) *dautzenbergiana* in the dull luster of the maroon surface, set with snow-white, hollow riblets. The spire is shaped as in *Macroceramus,* the postnepionic whorls not being contracted as in other species of this group. Figs. 5, 6 are copied from Pfeiffer; figs. 7, 8 are from Guajaybon examples. I have not examined the dentition.

Var. *aurea* Pils. (pl. 65, fig. 13). Differs by its light golden brown color, narrower and more widely-spaced ribs, and the noticeably more slender form.

Species of unknown systematic position.

Probably all the following belong to *Gongylostoma* in the wide sense, and if so are from western or perhaps central Cuba:

U. lucens ('Wright' Sowerby). Vol. XVI, Pl. 11, fig. 73.

"Shell subpyramidal, narrow, whitish, semi-pellucid; whorls 12, gradually increased, convex, last rather narrow, a little unwound; aperture rather round, depressed above, cuneate" (*Sowb.*).

Cuba (Wright, in Brit. Mus.).

Cyl. lucens Wright mss. B. M., Sowerby, C. Icon., xx, pl. 16, f. 135 (1875).

It is about 10 mm. long. Type is still in the British Museum.

U. moreleti (Pfeiffer). Vol. XVI, Pl. 11, figs. 80, 81.

Shell subrimate, somewhat fusiform-cylindric, smooth, glossy, pellucid, corneous-whitish; spire subcylindric, the *suture elegantly white-denticulate.* Whorls 11, but slightly convex, the last ornamented with a reddish line ascending at the suture; costulate anteriorly; shortly free, *the base rounded;* aperture somewhat oblique, circular; peristome whitish, narrowly expanded throughout. Length 20, diam. 4 mm.; diam. of aperture 4 mm. (*Pfr.*).

Cyl. moreleti Pfr., Monogr., iii. p. 566 (1853); Conchyl. Cab., p. 16, pl. 2, f. 26, 27.—Sowerby, C. Icon., xx, pl. 7, f. 59. Not *C. moreleti* Desh., see p. 38.

Described from Cumingian specimens, the habitat of which was unknown. The reddish band suggests relationship to *U. colorata* and its allies. The name is apparently preoccupied by Deshayes.

U. sagraiana (Pfeiffer). Vol. XVI, Pl. 11, figs. 87, 88.

Shell truncate, subcylindric, thin, pale corneous, lamellose-plicate, plicæ distant, nearly straight, alternating. Whorls 9, convex, the last angular below, a little built forward. Aperture suborbicular, the peristome thin, spreading. Length 13, diam. 4 mm.; diam. of aperture 2¾ mm. (*Pfr.*).

Western Cuba: Coffee plantation *Fundador,* near Matanzas (*Pfr.*).

Cyl. perplicata Fér., Pfr., Wiegm. Archiv f. Naturg., 1840, i, p. 41; in Philippi, Abbild., i, p. 182, pl. 1, f. 14.—*C. sagraiana* Pfr., Zeitschr. f. Malak., 1846, p. 120; Monogr., ii, p. 378; Conchyl. Cab., p. 28, pl. 4, f. 4-6.

Known only by a single dead shell found by Pfeiffer in the neighborhood of El Fundador on the Canimar. It has not again been encountered, and the internal structure is un-

known. It is probably related to *crispula, coronadoi* and their allies.

U. DENTICULATA (Pfeiffer). Vol. XVI, Pl. 13, figs. 12, 13.

Shell very slightly rimate, subulate, not truncate, thin, the surface undulated with obtusely projecting arcuate lines; pale corneous, variegated with whitish; spire long, the apex rather acute; suture closely denticulate with white. Whorls 19, rather flat, the last rib-striate in front; base carinate; not built forward. Aperture subcircular, the peristome expanded, somewhat interrupted above. Length 23, diam. 3.66, aperture 3.75 mm. long (*Pfr.*).

Mexico (Cuming Coll).

Cylindrella denticulata PFR., Monogr., iii, p. 580 (1853); Conchyl. Cab., p. 65, pl. 7, f. 14, 15.—SOWERBY in Conch. Icon., xx, pl. 3, f. 22.—*Macroceramus denticulatus* Pfr., FISCHER & CROSSE, Miss. Scient. Mex., Moll., i, p. 424.—MARTENS, Biologia Centr. Amer., Moll., p. 289.

Prof. von Martens with good reason doubts the habitat assigned to this species on the perilous authority of a Cumingian label. The incomplete peristome and entire apex suggest such forms of *Tomelasmus* as *U. acus* or *irrorata*. Similar sutural papillæ occur in *U. hidalgoi* and various other Cuban species; but until the interior is examined no estimate of its affinities can be made. It is not likely to be a *Microceramus*.

U. MULTISPIRALIS (Sowerby). Vol. XVI, Pl. 11, fig. 82.

"Shell very long, narrow, fawn; whorls 24, rather straight; last loosened some length. Aperture distant, subovate" (*Sowb.*, C. Icon., xx, pl. 9, f. 79; 1875).

Habitat unknown. A shell resembling *U. lateralis* is indicated. Messrs. Sowerby and Fulton inform me that it is not in their collection, and Mr. Edgar A. Smith states that it cannot be found in the collection of the British Museum.

The two genera now following, *Spirostemma* and *Anoma*, agree with *Urocoptis* in (1) the general structure of the shell, (2) the V-shaped rows of teeth, of which the centrals are

narrow and unicuspid, and the laterals have expanded mesocones and ectocones subterminal on the basal-plates, and (3) the jaw is delicate and plaited. They differ from *Urocoptis* in (1) the very much smaller size of the teeth and their vastly greater number, and (2) the cusps of the teeth, which present the extraordinary feature of being serrate at the cutting edges.

Both genera are Jamaican. The rank and affinities of neither have hitherto been recognized. They may be distinguished thus:

Spirostemma. Pillar-shaped, widely truncate at the summit; dull red or brown in color. Last whorl with a strong keel defining a concave basal area. Axis slender, cork-screw twisted in the last whorl or more, where it adheres to the lateral walls of the shell; and it is never thickened or truncate below. Aperture rounded above, the peristome continuous. Terrestrial.

Anoma. Fusiform, or at least rapidly tapering above to a narrow truncation; surface glossy, often variegated with bands or stripes; basal keel variable. Axis straight above, often slightly twisted and calloused or truncate below. Aperture truncate above, the peristome interrupted there. Arboreal.

Genus SPIROSTEMMA Pilsbry & Vanatta.

Spirostemma P. & V., Proc. A. N. S. Phila., 1898, pp. 270, 275 (July 12, 1898); type "*U. rubra* C.B.Ad."=*S. inusitata* Vend.—*Anoma* in part, Pfr., Nomencl. Hel. Viv., p. 275 (1878).

The shell is *pillar-shaped* or cylindric-fusiform, broadly truncate, monochromatic, *brown or reddish,* striate throughout, *dull* or hardly glossy; the last whorl is *strongly carinate below,* the keel bounding *a concave basal area.* The aperture is oblique, rounded-ovate, more or less angular at the termination of the keel. The peristome is obtuse and expanded or reflexed, *continuous,* arcuate and free or adherent above. The internal axis is coiled *cork-screw like,* at least in the later whorls or the last one. The protoconch is pupiform, with

3½ whorls, weakly ribbed vertically, the last smoother, the line of union with the after-growth distinct (Vol. XVI, pl. 11, fig. 89, *S. inusitata*).

The teeth of the radula are very numerous and extremely minute, placed in V-shaped rows. The central tooth in each row is very narrow, with a denticulate or serrate cusp, smaller than the ectocones of the lateral teeth. The lateral teeth have the mesocone expanded, with a straightly truncate, closely *serrate cutting edge;* ectocone smaller, with the edge serrate or nearly smooth. All of the side teeth are of substantially the same shape, and they are very numerous, the count exceeding 50.1.50.

[In *S. princeps* (pl. 43, fig. 10, a group of four laterals) the ectocones are rather long, narrow and smooth on the inner teeth, bifid on the outer (fig. 9). In *S. inusitata* from Swift River (pl. 43, figs. 11, 12) the central tooth has a single notch in the cusp, and the adjacent marginal teeth have simple, conic, short ectocones; the lateral teeth farther out (fig. 11) have the ectocones serrate. In *S. tenella* from west of Ocho Rios the teeth are decidedly smaller, narrow and crowded, with the cusps subterminal on the basal-plates, and all are serrate (pl. 43, fig. 13).]

Jaw and soft anatomy unknown. The shells are illustrated on plates 34a to 37; the teeth on pl. 43, figs. 9 to 13.

The specimen I figured in 1898 as "*U. rubra,*" for the type of this genus is not that species, but *S. inusitata* Vendr.

In its most advanced type, represented by *U. tenella* and allied species, the axis is like a cork-screw, or a spiral stairway around a central well, which may be seen on looking into the aperture from below. In the group of *U. princeps,* the central hole may still usually be seen, though smaller. In *U. dunkeri* the axis is hardly spiral beyond the last whorl. As in other *Urocoptinæ* the axis is a solid style.

. This genus is closely related to *Anoma,* which has the same type of teeth; but in *Anoma* the peristome is not continuous above, the aperture being truncate there; the shell is more or less swollen, instead of being pillar-shaped, and it is glossy, usually more or less variegated or bright-colored; moreover,

in *Anoma* the axis, while twisted, is not distinctly spiral, as it is in *Spirostemma*.

The Spirostemmas live on the ground in thickets, and from their shape and color look like the pieces of broken twigs among which they live, so that they are likely to escape notice unless especially looked for. They occur in most parts of the interior of Jamaica, and the genus is like *Anoma* in being locally differentiated into a large number of species and races, characterized by small but apparently rather constant differences, the main variation among individuals of any one place being in size. The geographic ranges of part of the described forms are unknown, owing to Professor Adams' unwillingness to state the localities of his types. The characters of part of the species have been but inadequately described. These two circumstances, together with the great similarity of the shells, render the determination of species difficult and uncertain.

I. Axial well or false umbilicus visible in the aperture viewed from below as a large hole. Group of *S. tenella,* species no. 12 to 15.

II. False umbilicus not visible in the aperture, or only as a small hole. Group of *S. dunkeri,* species no. 1 to 11.

Group of S. dunkeri.

When some of these are better known they may prove to belong to the group of *S. tenella.*

Last whorl very shortly or not free, the peristome adherent to preceding whorl above, or nearly so.

No. 1. *S. dunkeri.* Length 6 to 7 times the diam.; 15.3 x 2.7 to 20 x 29 mm., whorls 10½-12½; brown; greatest diam. at or below the middle. St. Catharine, St. Elizabeth and Clarendon.

No. 2. *S. alta.*

No. 3. *S. bellevuensis.* Length 4½ times the diam.; 13 x 3 mm., whorls 10; light brown; widest at the lower third. Bellevue, St. Andrew.

Peristome free above, the last whorl built forward.

No. 1. *S. dunkeri.* Last whorl only very shortly free. See above.

No. 4. *S. princeps.* Length 7 times the diam.; 24-25 x 3.5-3.7 mm., 11½-12 whorls; cylindric, with flat whorls and seam-like suture; brown; *keel very strong;* last whorl well projecting. Interior of western Portland.

No. 5. *S. carinata.* Length 5½ times diam.; 22 x 4 mm., whorls 12; fleshy-fulvous; last whorl shortly free.

No. 6. *S. inusitata.* Length nearly 6 times the diam.; 17-18 x 3-3.1 mm., with 11-12 whorls; reddish or pale brown; widest at or below the middle; aperture free in front. Western Portland.

No. 7. *S. ipswichensis.* Length from 5 to 6 times the diam.; 13-15.7 x 2.3-2.7 mm., whorls 10⅓-12; red-brown or pinkish. Ipswich, St. Elizabeth.

No. 8. *S. rubra.* Length 5½ times the diam.; 20.5 x 3.75 mm.; deep red; greatest diam. at or above the middle.

No. 9. *S. cognata.* Length 5 times the diam.; 15 x 3 mm.; whorls 11-12; pale brown; widest below the middle; last whorl free and descending in front; aperture very oblique. St. Andrew, in the mountains.

No. 10. *S. similis.* Length 5 times the diam.; 12 x 2.3 mm.; pale brown; last whorl quite shortly free.

No. 11. *S. intermedia.* Length 13 mm.; whorls 11; brown; aperture shortly free.

1. S. DUNKERI (Pfeiffer). Pl. 36, figs. 62-65; 67-75.

Shell cylindric or pillar-shaped, slightly and slowly tapering above, brown or dark reddish-brown. Surface nearly lusterless, sculptured with oblique, slightly arcuate riblets, which are about half as wide as their intervals. Whorls about 12, but slightly convex, the last strongly carinate below, noticeably concave above the keel, very shortly or not free in front. Aperture very oblique, inverted ovate, being angular below with a corresponding gutter within. Peristome obtuse, narrowly reflexed, continuous, free above or against the preceding whorl. Internal axis strongly spiral in the last whorl only, nearly straight in the others (fig. 67).

Length 19.5, diam. 3.2 mm.; whorls 11½ (Bogwalk).

Length 20, diam. 2.9 mm.; whorls 12½ (Stanmore).

Length 17, diam. 2.8 mm.; whorls 12⅓
Length 15.3, diam. 2.7 mm.; whorls 10½ } (Teak Pen).

Jamaica: Interior of the parishes of St. Catherine at Bogwalk (Johnson and Fox, Henderson), and Watermount (Jarvis); Clarendon, at Teak Pen (Jarvis); St. Elizabeth at Stanmore (Jarvis).

Cyl. dunkeri Pfr. in Philippi, Abbild., ii, p. 51, pl. 2, f. 9 (Oct. 1845).—*C. dunkeriana* Pfr., Monogr., ii, p. 383; iii, 580; iv, 711; vi, 359.—Sowerby, Conch. Icon., xx, species no. 69, pl. 8, f. 79.—Johnson & Fox, Nautilus v, p. 34.—Gloyne J. de Conch., 1875, p. 122 (St. Anne).—*C. rubra* C.B.Ad., Henderson, Nautilus viii, p. 19, no. 96 (Bogwalk).

This species differs from *U. princeps* by its straighter axis and less projecting basal keel, and by the scarcely produced last whorl, which in *princeps* is built forward, carrying the aperture free of the preceding whorl.

Figures 64, 65 are copies of the original figures in Philippi's *Abbildungen;* 62, 63 are figures subsequently published by Pfeiffer. Figures 67-71 represent specimens from Bogwalk.

2. S. alta (Sowerby). Pl. 36, fig. 66.

"Shell narrow, elongated, red, very slowly attenuated; whorls raised smooth, very straight, the last rather convex, keeled below, excavated under the keel; aperture perpendicularly ovate. A narrow shell with straighter whorls than *C. carinata,* with the keel on the last whorl less prominent."

Cyl. cylindrus Chemnitz, Sowerby, Conch. Icon., xx, pl. 8, f. 68 (1875) = *C. alta* Sowerby, Index to Monogr. of Cylindrella.

The synonymy given by Mr. Sowerby betrays some lack of that punctilious regard for accuracy which should characterize the monographer. The figure reminds me of the Bogwalk form of *S. dunkeri.*

3. S. bellevuensis Pilsbry, n.n. Pl. 34a, figs. 7, 8.

"Shell rimate, cylindrical, nearly white, under a light brown epidermis, which becomes paler towards the apex; the spire widens very gently from the base of the penult. whorl

to about one-third above it, where the greatest diameter is reached, and thence it tapers to the truncate apex; apex truncate with the loss of 8 to 9 whorls, whorls remaining 10, less deep and less flattened than on *dunkeriana,* the first two above the base subangular about the periphery, the last more strongly carinated than in *dunkeriana,* with the carina continued down to the base of the aperture; striæ very strong, compact and wavy, extending across the whorls to the very edge of the well-impressed suture; aperture oblique like that of *dunkeriana,* but the peristome is thinner and is appressed above to the penult whorl. Height 13 mm., greatest breadth at the slender part of the spire 3 mm." (*Vendryes*).

Jamaica: Bellevue, near Stony Hill, in the parish of Saint Andrews (Vendryes; Gloyne).

Cylindrella (*Anoma*) *propinqua* VEND., Nautilus xv, p. 3, pl. 1, f. 7, 8 (May 1, 1901). Not *C. propinqua* Arango.

" The shell comes near to *dunkeriana,* but it has 10 whorls which are less planulate than on that species, and the striation is rather coarser and less regular; the color of *dunkeriana* is also different. Gloyne, in Journ. de Conch., vol. xx, reports it as *similis* from Bellevue. Bland had identified them with great doubt as *similis.* On closer examination they turned out to be unlike *similis* or any other Jamaican species of Anoma " (*Vendryes*).

This form may belong to the *tenella* group. I have not seen specimens.

4. S. PRINCEPS (C. B. Adams). Pl. 36, figs. 76-80.

Shell pillar-like, but slightly tapering near the broadly truncate summit, brown, darker at the suture, or corneous-brown throughout; finely, obliquely striate. Whorls about 11½ to 12, *flat,* the last contracted above the *very strongly projecting basal keel;* produced forward. Aperture inverted-ovate, somewhat oblique, angular at the base; the peristome reflexed. Internal axis moderately spiral, the false umbilicus not visible in the aperture, or showing as a very small hole.

Length 24, diam. 3.5 mm.

Length 24.5, diam. 3.7 mm.

Jamaica: Swift River head, St. George district of Portland parish (C. B. Adams).

Cyl. princeps C. B. A. Contrib. no. 9, p. 167 (April, 1851). —Pfr., Monogr., iii, p. 580; iv, 711; vi, 359; vii, 434.

The largest species of the group, apparently distinct by its flat whorls, strong basal keel, and projecting aperture. The suture is seam-like, projecting rather than impressed, the smooth keel visible above it.

5. S. CARINATA (Pfeiffer). Pl. 35, figs. 50, 51.

Shell slightly rimate, subcylindrical, tapering above, truncate, obliquely striate, with a silken luster, fleshy-fulvous. Whorls remaining 12, rather flattened, the last shortly free, compressed-carinate at the base. Aperture oblique, oval, angular at the base, the peristome shortly expanded throughout. Length 22, diam. 4 mm.; aperture 4 mm. long, 3 wide (*Pfr*).

Cyl. carinata Pfr., P. Z. S., 1852, p. 68; Monogr., iii, p. 571. —Sowerby, Conch. Icon., xx, pl. 8, f. 67.

Habitat unknown (Mus. Cuming).

The description and Sowerby's figure indicate a shell similar to *S. princeps,* but with a larger aperture and greater diameter.

6. S. INUSITATA (Vendryes). Pl. 34a, figs. 1, 2.

"Shell much elongated, cylindrical, rimate, somewhat shining and transparent, color light brown; spire slightly tapering both above and below its greatest diameter, which is about the middle; truncate with the loss of 7 to 8 whorls, whorls remaining 11 to 12, planulate, shouldered by an early obsolete angle, the last detached and descending, strongly carinated at the base, the carina extending to the back of the aperture; striæ waved, strong and compact, crossing the whorl obliquely and continued up to and many crossing over the edge of the suture, which appears fringed here and there by their intrusion; aperture like that of *dunkeriana,* but rather larger in proportion to the shell, and less oblique than in that species, well produced over the penult. whorl. Height 18 mm., greatest breadth above the middle of the

spire, 3½ mm.; aperture, 3 mm. high, 2¼ mm. wide." (*Vend.*)

Jamaica: Upper Leighton, near Spring Garden Estate, in the St. George District of Portland parish in the mountains (Mr. Bancroft); Swift River, near Hope Bay, Portland (Wm. J. Fox).

Cylindrella (*Anoma*) *inusitata* VENDRYES. Nautilus XV, p. 1, pl. 1, f. 1, 2 (May, 1901).—*C. rubra* C.B.Ad., JOHNSON, Nautilus V, 1891, p. 34; PILS. & VAN., Proc. A. N. S. Phila. 1898, p. 275, pl. 18, f. 12 (axis).

"This species is remarkable for its produced and detached aperture, placing it in the same group to which *princeps* belongs."

Specimens from Swift River, Portland collected by W. J. Fox and C. W. Johnson in 1891 agree fairly with Vendryes' description. They vary from reddish-brown to pale corneous-brown, and one is white. The upper third or half tapers slowly, and the greatest diameter is at or sometimes below the middle. The axis is only slightly sinuous, and no false umbilicus is visible in the aperture from below. The aperture is slightly angular below, and the peristome is white and free. Specimens measure 17 to 18 x 3 to 3.1 mm., with 11 to 11½ whorls. The apical whorls are delicately ribbed (Vol. XVI, pl. 11, fig. 89).

7. S. IPSWICHENSIS n. sp. Pl. 35, figs, 52, 53, 54.

Shell slender, pillar-shaped, the upper third or fourth slowly tapering, thin, red-brown or pinkish. Surface hardly shining, finely and closely striate. Whorls 11 to 12, hardly convex, the last one tapering, very strongly carinate beneath, concave above the keel; produced forward. Aperture oblique, subcircular, but a trifle longer than wide, peristome white or pale brownish, continuous and free, well reflexed and somewhat thickened, evenly arcuate throughout. Internal axis rather strongly sinuous throughout, reinforced by an adjacent basal lamella within the front and left side of the last whorl.

Length 15.7, diam. 2.7 mm.; whorls 11¾.

Length 15, diam. 2.3 mm.; whorls 11¾.

Length 13, diam. 2.3 mm.; whorls 10⅓.

Jamaica: Ipswich, in the interior of St. Elisabeth parish (Henderson and Simpson).

A larger species than *S. similis,* with the basal keel much stronger. In *S. ipswichensis* the length is between 5 and 6 times the diameter.

8. S. RUBRA (C. B. Adams).

Shell red, cylindrical, similar to the preceding [*C. cumingii* =*Brachypodella elongata*] but more finely striate, widely truncate; whorls remaining 12, not very convex; aperture subovate, expanding in a rather thin lip; last whorl acutely carinate. Length .82, width .15 inch [20.5 x 3.75 mm.]. It is perhaps a variety of *C. dunkeri* Pfr., but differs in having the greatest diameter at or above the middle of the shell, while in the latter it is at the lower third, above which the shell tapers regularly. *C. rubra* is larger, has coarser striæ, and is always deep red (C.B.Ad.). *Jamaica.*

Cyl. cylindrus C.B.A., Synops. Conch. Jam., Proc. Bost. Soc. N. H. 1845, p. 14 (preoc.) = *C. rubra* C. B. A., Contrib. no. 2, p. 23 (Oct., 1849).

The original account is given above. I have not identified the species.

9. S. COGNATA (Vendryes). Pl. 34a, figs. 3, 4.

"Shell rimate, cylindrical, elongated, color very light pale brown; spire tapering from the last whorl to the summit; apex truncate, with the loss of 7 to 8 whorls, whorls remaining 11 to 12, subplanulate, slightly shouldered, the last detached and descending, strongly carinated at the base, carina continued to the back of the aperture; striæ very strong and compact, irregularly spaced and waved here and there, some crossing over the sutures from one whorl to the other; aperture as in *inusitata,* but less elliptical, well produced beyond the penult whorl. Height, 15 mm.; greatest breadth, 3 mm.; aperture, 2½ mm. high, 2¼ mm. wide." (*Vendryes*).

Jamaica: Government cinchona plantations, in the mountains of St. Andrew, about 3,500 ft. above sea level (Mr. Hart).

Cylindrella (*Anoma*) *cognata* VEND., Nautilus xv, p. 1, pl. 1, f. 3, 4 (May 1, 1901).

The aperture is very oblique, as in the *tenella* group.

10. S. SIMILIS (C. B. Adams). Pl. 35, figs. 47, 48, 49.

Shell pillar-shaped, the upper third or fourth of the length tapering, pale brown, minutely and closely striate. Whorls 10-10½, the earlier ones convex, later whorls less so, the last whorl carinate below, quite shortly free in front. Aperture oblique, subcircular, the lip well reflexed, wider above and on the left side. Internal axis rather strongly spiral in the last 4 whorls. Length 12, diam. 2.3 mm.; whorls 10½.

Jamaica.

Cyl. similis C.B.AD., Contrib. no. 2, p. 23 (Oct. 1849).—PFR., Monogr., iii, p. 580; Conchyl. Cab., p. 68, pl. 7, f. 24-26. —GLOYNE, Journ. de Conchyl., 1875, p. 122.

The description and figures 47-49 are from specimens received from Adams. Pfeiffer has figured a similar shell. The outline of the aperture is but slightly modified by the basal keel, but often the peristome is somewhat produced in the middle of the columellar margin, and perceptibly less arcuate on each side of this slight lobe (fig. 49), giving the mouth a characteristic contour, even though the departure from the circular form is but slight. The last whorl is produced forward less than in *U. elatior.*

Adams' original account follows: "*Cylindrella similis* is perhaps another variety of *C. dunkeri* Pfr., but is much smaller, has the aperture less angulated anteriorly, angulated at the left end of the upper side, and the lip is much more arched above; the striation is finer in proportion to the size; 9 or 10 whorls are lost by truncation, and 12 remain. Length .475 inch., breadth .09 inch."

Gloyne reports finding two specimens above Newcastle.

11. S. INTERMEDIA (Sowerby). Vol. XVI, pl. 11, fig. 74.

"Shell cylindrical, high, narrow, brown, contracted towards the apex; permanent whorls 11, striated, rather straight. Aperture a little disjoined, large, obliquely ovate; margin thick." (*Sowb.*).

C. intermedia SOWB., C. Icon. xx, pl. 10, f. 91 (1875).

Habitat unknown; type in coll. Sowerby. I refer it to

Spirostemma with a good deal of doubt, as the basal keel is not mentioned in the description, though shown in the figure. It is 13 mm. long.

Group of S. tenella.

False umbilicus large as seen in the aperture from the base.

I. Last whorl built forward carrying the aperture free of the preceding; length 20-23 mm. *S. elatior,* no. 12.

II. Peristome either adnate above or barely free; basal area very small; shell smaller.

1. Aperture contracted by a callous nodule on the parietal wall near the columella. *S. abnormis,* no. 14.

2. No parietal nodule.

a. Length 10-12 mm., whorls 9-13. *S. tenella,* no. 13.

b. Length 7-9 mm. *S. tenera,* no 13a.

c. Length 6 mm.; whorls 7-8. *S. pusilla,* no. 15.

12. S. ELATIOR (C. B. Adams). Pl. 37, figs. 80, 81, 82, 83, 94.

"This is also a larger shell than *C. dunkeri,* thicker, and strongly striated, with the whorls more planulate; it is much longer and more slender than *C. rubra.* Length .93 inch, breadth .13 inch [23.2 x 3.2 mm.] (*Adams*).

Jamaica: Westmoreland (Adams).

Cyl. elatior C.B.A., Contrib. to Conch. no. 9, p. 167 (April, 1851).—PFR., Monogr., iii, p. 580. BLAND, Ann. Lyc. N. H. of N. Y., vi, p. 150, pl. 5, f. 19.

This is an almost *exactly cylindric* shell except that the upper fourth or less of the length tapers. It is roseate, with the whorls barely convex, almost flat, the last one acutely carinate as usual, and shortly built forward. The aperture is decidedly oblique, very shortly or roundly oval, the lip old Isabella tinted. The axis is *very strongly spiral* throughout the greater part of the shell, "like a spiral stairway constructed with a conical well-hole instead of a column." *This central well may be seen as a large hole by looking into the aperture from below,* as in *S. tenella.* Specimens measure, 20.7 x 3 mm., whorls 13½; 19 x 3 mm., whorls 12.

13. S. TENELLA (C. B. Adams). Pl. 37, figs. 88-91.

Shell slender, cylindric-fusiform, widest at or above the middle, *tapering towards the summit, and slightly so to the last whorl; pale brownish corneous*, thin, and slightly translucent, or red-brown and opaque. Surface glossy, obliquely striate, the striæ obtuse and not so wide as their intervals. Whorls usually 11 to 13, almost flat, the suture margined above; last whorl strongly carinate below, *the basal area small.* Aperture *very oblique,* ovate-rounded, narrower below; peristome white, narrowly expanded and subreflexed, *the upper margin adnate to the preceding whorl,* or shortly built forward. Internal pillar forming a wide, open spiral, corkscrew-like, in the last two or three whorls, upwards becoming progressively less twisted. Looking in the aperture from the base, *a wide false umbilicus, about one-third the diam. of the shell, may be seen.* (fig. 91).

Length 12, diam. 2 mm.; whorls 13.

Length 11, diam. 2 mm.; whorls 11½.

Length 10.3, diam. 1.8 mm.; whorls 11 (Troy).

Length 11.5, diam. 2.5 mm.; whorls 11
Length 10, diam. 2.5 mm.; whorls 9 } (Little River).

Length 12.5, diam. 2 mm.; whorls 11½ (W. of Ocho Rios).

Jamaica: Troy, in St. Elizabeth Parish (P. W. Jarvis); Bogwalk, St. Catherine; west of Ocho Rios and St. Ann's, St. Ann; Falmouth, (Henderson), and Claremont (Jarvis), in Trelawny; Montego Bay and Little River, St. James (Henderson and Simpson).

Cyl. tenella CBA., Contrib. to Conch. no. 2, p. 23 (Oct. 1849).—PFR., Monogr., iii, p. 580; Conchyl. Cab. p. 68, pl. 8, f. 13-15 (*C. tenelle*).—SOWERBY, Conch. Icon. xx, pl. 11, f. 101.—BLAND, Ann. Lyc. N. H. of N. Y. vi, p. 150.—HENDERSON, Nautilus viii, p. 19, no. 97.—GLOYNE, J. de Conchyl. 1875, p. 122. (Derry, in northern Manchester). *Cyl. tenera* C.B.A., *l. c.*

A widely distributed species in central and northern Jamaica. It varies a good deal in color, striation and size, some shells, as at Troy, being corneous and glossy, while at most places on the northern coast the shells are red-brown and more strongly striate.

Var. *tenera* C.B.Ad. "also resembles *C. dunkeri* in color and *C. rubra* in form. It is very small, has the aperture orbicular, and the striation microscopic. It loses 6 whorls by truncation and has 10 remaining. Length .28 inch., breadth .055 inch." (C.B.Ad.).

Some specimens before me, probably referable to this variety, are larger, length 8.4, diam. 1.8 mm. (pl. 37, figs. 92, 93).

14. S. ABNORMIS (Vendryes). Pl. 34a, figs. 5, 6.

"Shell deeply rimate, cylindrically elongated, color brown with a very slight tint of yellowish-red, shining; spire broadly truncate with the loss of—whorls, whorls remaining 9, the last and the three following it are more drawn out and consequently deeper than the remaining ones, the last is slightly narrower in diameter than the second, the second than the third, and the third than the fourth, thence the remaining whorls become less deep and gradually diminish in diameter to the truncated apex, so that the outline of the shell presents the form of a long, narrow, drawn-out purse, somewhat bulging about the middle, and thence tapering towards the bottom; whorls slightly convex, obtusely angulated at the periphery, sculptured with strong, thick lamella-like costulæ crossing the whorls obliquely, generally curvilinear, irregular in some places and wavy here and there, extending to the very shoulder of the whorls, the last whorl with a prominent carina which extends to the back of the base of the aperture close to the peristome; suture well incised; aperture inclining to the right, the plane very oblique, peristome thick, nearly white, smooth and shining, reflected all around, with a very large, strong, elevated knob close over the spot where the columellar lip should merge into the columella, and apparently arched over the space of the entering rima beneath. Total length, 11 mm.; greatest breadth at middle of spire, 3 mm.; next above the aperture, 2 mm.; at the truncation, 2 mm." (*Vendryes*).

Jamaica: Parish of St. Ann, near Brown's Town, among fine earth and vegetable debris from the roadsides.

Cylindrella (*Anoma*) *abnormis* VEND., Nautilus xv, p. 3, pl. 1, f. 5, 6 (May 1, 1901).

Described from a single specimen in coll. Vendryes, possibly a pathologic *S. tenella.* The name has been used for a Cuban form but not defined, so this Jamaican form need not be renamed.

15. S. PUSILLA (C. B. Adams). Pl. 37, figs. 84-87.

Shell very small, narrowly fusiform, widest in the middle, tapering towards both ends, pale brownish corneous. Striæ delicate and narrower than the intervals. Whorls 7 to 8, moderately convex, the last angular around a *very narrow concave basal area.* Aperture very oblique, rounded; peristome obtuse, slightly expanded, the upper margin adnate to the preceding whorl. Internal axis strongly spiral in the last two whorls, showing a wide corkscrew spiral when viewed from the base, in the aperture. Length 6, diam. 1.6 mm.

Jamaica: Aenon Town, St. Ann (P. W. Jarvis).

Cyl. pusilla C.B.A., Contrib. no. 7, p. 102 (April, 1850). —PFR., Monogr., iii, p. 581.

The smallest member of this group. It is related to *S. tenella,* but differs by its smaller number of whorls and shorter, more fusiform contour.

APPENDIX TO VOL. XV.

Genus ANISOSPIRA (see p. 24).

A single individual of *A. townsendi* in alcohol, sent by Professor T. D. A. Cockerell, enables me to partially characterize this genus anatomically. It has hitherto been known by the shell only. The specimen was retracted deep in the shell, was quite hard, and could be removed entire only by the use of acid or by cutting the shell. As the preservation of the latter was desirable, I cut the back partly off and removed the soft parts as best I could, but not in condition to give any definite data upon the pallial organs or retractor muscles.

The genitalia (pl. 63, fig. 55). The penis is very short and globose, its retractor and epiphallus inserted at the broad, flattened apex. It contains a very short, high pilaster. The retractor muscle of the penis is inserted on the floor of the lung, as usual. The epiphallus is at least four times the length of the penis. The vas deferens is imbedded in the wall of the vagina for a short distance, but emerges and follows a sinuous course on the surface of the oviduct. The vagina is short and capacious, its cavity with the usual longitudinally plicate walls. The duct of the spermatheca is very long, only a little swollen distally. The ovotestis was not obtained. There is a stout muscle intimately attached to the upper portion of the vagina, but its other connections were not observed. It may be the right ocular retractor (fig. 55, *m*).

The jaw is highly arched, rather thin, though far stronger than in *Urocoptis*, and densely, irregularly striate vertically. There is very slight projection or imbrication at some of the striæ (pl. 63, fig. 51, *A. townsendi*).

The radula is squarish as usual, its length about three times the breadth. Formula of teeth 27.1.28. The rows are

nearly straight. All of the teeth have squarish basal-plates. Centrals with a large mesocone, slightly longer than the basal-plate, ectocones almost obsolete, merely overhanging slightly at the sides. Lateral teeth a little longer, but not wider than the centrals, with a large mesocone and small ectocone. Towards the margins the basal-plates shorten, as usual, and the mesocones become proportionally somewhat longer. Neither cusp is bifid, even on the outer teeth, and there is nowhere any indication of an entocone (pl. 63, figs. 52, 53, 54, *A. townsendi*).

The genitalia resemble *Eucalodium* in the long vas deferens, other characters being common to both *Eucalodium* and *Cœlocentrum*. The jaw is like that of *Eucalodium, Archegocoptis,* etc., being intermediate between the striate and plaited types, but more solid than the latter. The teeth are similar to those of *Eucalodium* and *Cœlocentrum*. The axis is a larger tube than in any *Eucalodium,* but smaller than in *Cœlocentrum*. *Anisospira* is therefore somewhat intermediate between these two genera. Further information is needed on the free retractor muscles, which are not alike in *Cœlocentrum* and *Eucalodium*.

A. RECTICOSTA (Pfr.). Vol. xvi, pl. 11, figs. 83, 84.

See p. 16. I am informed by Mr. H. Fulton that on opening a specimen of *recticosta* in the Sowerby and Fulton collection, he found it to be an *Anisospira*. This specimen is 34 mm. long, with 8 whorls, the lower four forming a cylindric portion 11 mm. in diam., those above tapering so that the second whorl has a diam. of 7 mm. The color is waxy-white. The axial lamella makes two volutions. The shell is labelled "Mexico." I am indebted to Mr. Fulton for the foregoing details. The exact locality of the type specimen, from Cuming's collection (vol. xvi, pl. 11, figs. 83, 84, after Philippi) was unknown. The original description is given on p. 16. The species differs from var. *townsendi* by the longer taper of the spire, and the much greater width of the whorls from suture to suture. Probably the specimens recorded from Cualata, Colima (Wm. Lloyd), belong to var. *townsendi*. *Urocoptis* (*Brachypodella*) *reticosta* Pfr., H. & A. ADAMS, Gen. Rec. Moll., ii, 177, is a synonym.

Var. TOWNSENDI Pilsbry & Cockerell, n. v. Vol. xvi, pl. 11, figs. 85, 86.

Shell rimate, not perforate, cylindric, the upper fourth rather rapidly tapering, gray-white, rather thin. Surface lusterless, sculptured with rather coarse rib-striæ, crowded, and about as wide as their intervals. There are about 3 striæ to a millim. on the last whorl; about four on the middle whorls. Whorls convex, the last very shortly free in front, rounded below, the baso-peripheral keel barely indicated, not raised. Aperture nearly circular, oblique, the peristome continuous, slightly expanded, very narrowly reflexed, whitish. Columella straight. Axis a small transparent white tube with white oblique lines; noticeably swollen in each whorl; within the last three whorls bearing at its base an *acute spiral lamella, 2½ whorls long.* Length 31, diam. 9.5 mm.; whorls 8⅓; longest (oblique) axis of aperture 7.7, width 7.4 mm.

Western Mexico: Cualata, state of Colima (Prof. C. H. T. Townsend, July, 1902).

This species tapers less above than most of those known. The sculpture is very much coarser than in *A. liebmanni* or *dalli,* about as in *strebeli,* but the riblets are more crowded. The internal lamella is longer than in any other species known. Soft anatomy described above.

A. recticosta is a somewhat larger form, and tapers more gradually. In *townsendi* the last 5 whorls are of equal diameter, forming a cylinder, only the first three whorls tapering. The penult whorl is 3.5 mm. wide, from suture to suture, in front. There is no such basal angle as is described for *A. recticosta,* and the rib-striæ continue undiminished on the base.

Genus CŒLOCENTRUM C. & F.

CŒLOCENTRUM FISTULARE (Morel.). See p. 41.

Another synonym is *C. acutispira* Pfr., Paetel, Catalog, ii, p. 245 (1889), based upon *C. arctispira* Tristram; or rather, it is an error for that name.

Genus HOLOSPIRA v. Mart.

HOLOSPIRA COCKERELLI Dall.

"Shell small, pupiform, blunt-tipped, with two smooth

nuclear and about a dozen subsequent whorls; those following the nucleus are rather strongly obliquely ribbed with close set fine riblets which become fainter over the main body of the spire and reappear again on the last whorl; aperture entire, simple, rounded, but a little angular at the posterior outer corner; the umbilicus closed, the spire gradually enlarging to the eleventh whorl, then slightly attenuated. Alt. 12.5, max. diam. .32 mm." (*Dall*).

New Mexico: In the débris of the Rio Grande at Mesilla (T. D. A. Cockerell).

Holospira (*Haplostemma*) *cockerelli* DALL, Nautilus, xi, p. 62 (Oct., 1897).

" This is the second species of *Haplostemma*, and one of the smallest, if not the smallest, *Holospira* yet recorded."

HOLOSPIRA ROEMERI (p. 97), var. *minor* STERKI, Nautilus, vi, p. 6 (nude name).—COCKERELL, Nautilus, xi, p. 136 (last four lines), based upon var. *b* BINNEY, Man. Amer. Land Shells, p. 422 (" Smaller, more ventricose above; whorls 12, the last more briefly loosened; length 11, diam. above the middle 4 mm."). This form is merely an individual variation.

Genus ARCHEGOCOPTIS Pilsbry, 1903.

Shell pillar-shaped, broadly truncate, with a flattened, steeply-sloping plug, and six to ten whorls in adults; the amputated early portion of the spire long and many-whorled, attenuate; protoconch of nearly 4 whorls, the first one high, turned down and smooth at the apex, elsewhere sculptured with irregularly-spaced vertical riblets; following whorls with groups of short riblets below the suture (pl. 41, fig. 69). Surface of the post-nepionic shell lusterless, densely sculptured with fine, waved, irregular striæ (pl. 41, fig. 70). Whorls flattened, the last carinate below, shortly free in front. Aperture subcircular, the peristome continuous. Axis slender and straight, imperforate.

Jaw arcuate, moderately strong, densely and irregularly striate vertically, 1.2 mm. long (pl. 63, fig. 46 × 60; fig. 47 × 300, *A. crenata*).

Radula wide, of the usual proportions, with 21.1.21 teeth in

nearly straight transverse rows. Teeth of normal Helicid type, the basal-plates square, about as wide as long, or wider. Central teeth as large as the adjacent laterals, tricuspid, the mesocone large, with conic cusp slightly longer than the basal-plate; ectocones minute. Laterals similar but asymmetrical, with no trace of an entocone on any of the teeth. The marginal teeth are merely shortened laterals, with rounded, simple mesocones, and small, simply conic ectocones, the cusps obsolete on the outermost teeth as usual (pl. 63, figs. 48, 49, 50, *A. crenata*). Soft anatomy otherwise unknown.

Distribution, western Haiti. Type *Cylindrella crenata* W. & M. (*Archegocoptis*, first of the cut-off race).

The striate, not plaited jaw, and the normal, Helicid radula isolate *Archegocoptis* among Antillean genera of *Urocoptidæ*, and ally it to the continental genera *Eucalodium*, *Anisospira*, and their kin. By the structure of its slender axis, and of the steeply-sloping plug at the summit *Archegocoptis* stands nearest *Eucalodium;* but in the latter genus there is usually a minute axial perforation, while *Archegocoptis* has an imperforate axis. The exact affinities of *Archegocoptis* to the various other genera of *Eucalodiinæ* will be determined by the structure of the free retractor muscles and other soft parts, which cannot be worked out from the dry specimens in my possession, which were collected by Mr. J. B. Henderson, Jr., at Jeremie, Haiti. Whether the genus is to be regarded as a remnant of the original stock of Antillean *Urocoptidæ*, retaining the archaic type of mouth parts, or is a later immigrant from the continent, it is at present impossible to decide.

Key to species of Archegocoptis.

1. Basal keel very strongly projecting; peristome hardly expanded. *A. eximia.*

2. Basal keel a moderately strong cord; peristome expanded and somewhat reflexed. *A. crenata.*

1. A. EXIMIA (Pfeiffer). Pl. 38, figs. 1-4; pl. 41, figs. 67, 68, 69, 70.

Shell cylindric below, the upper half or two-thirds slowly tapering to a rather wide truncation, closed by a steeply slop-

ing, convex plug. Purple-brown, the upper whorls and latter part of the last dull red, the whole more or less covered with a whitish or light brown coat of very fine, short striæ, which give the shell a dingy or dusty appearance; specimens denuded of this being dark purple or red; suture usually marked with a white line. Surface lustreless, minutely and densely sculptured with very fine, wavy, interrupted striæ; *a row of pits above the suture* and some irregular spots elsewhere free of striæ. Whorls 8 to 9½, nearly flat, the last shortly built forward, and having *the base encircled by a narrow, very strongly projecting keel,* below which the striæ are obsolete. Aperture subcircular, oblique, the peristome pale and but slightly expanded. Axis slender and straight.

Length 31, diam. 8 mm.; whorls 8.

Length 32, diam. 7.4 mm.; whorls 9⅓.

Haiti: Aux Cayes (C. Ross); Jeremie (Rolle).

Cyl. eximia Pfr., Malak. Bl., iv, 1857, p. 232; Monogr., iv, p. 694; vi, 363; Novit. Conch., iii, p. 439, pl. 97, f. 30-32; Mal. Blätt., xxiii, 1876, p. 215; 1869, p. 91.—Crosse, J. de C., 1868, p. 347; 1891, p. 137, pl. 1, f. 5, 6.—Sowerby, Conch. Icon., xx, pl. 1, f. 6 (gay).—*Helix* (*Cochlodina*) *petiveriana* Fer., Tabl. Syst., p. 61, no. 498 (1822 ?), based upon poor and not certainly identifiable figures.

The peculiar sculpture is characteristic. It is related to *A. crenata,* but differs in the far stronger basal keel, the smaller aperture and less expanded peristome, and the clear-cut sculpture. The specimens before me are from Aux Cayes; I have seen only *crenata* from Jeremie.

The apex is scalar, turned down at the tip, and coarsely sculptured with wide-spaced riblets (pl. 41, fig. 69).

2. A. crenata (Weinland & Martens). Pl. 41, figs. 73, 74, 75; pl. 38, figs. 5, 6, 7.

Shell cylindric below, the upper half or more slowly tapering to a wide truncation closed by a flat, subvertical pustulate plug. Penult. and next earlier whorls usually dull purplish-blue in part, the rest of the shell dull red or white. Surface having a worn or dusty appearance, very finely and closely sculptured with waved striæ, generally showing also some low, coarse spiral girdles or malleation, and above the suture a

series of shallow pits. Whorls ordinarily 7½ to 8½, but slightly convex, the last shortly free in front, having a narrow, cord-like carina around the base, which is convex and sculptured with straight, thread-like striæ. Aperture subcircular, oblique, the peristome expanded, subreflexed.

Length 30, diam. 8 mm.; whorls 7⅔.

Length 26, diam. 7.7 mm.; whorls 6½.

Length 35½, diam. 7.8 mm.; whorls 12½.

Length 39, diam. 8.5 mm.; whorls 8 (v. Mart. type).

Haiti: Jeremie (Weinland, J. B. Henderson); Anse d'Hainault (H. Rolle).

Cyl. crenata Weinl. & Mart., Martens, Malak. Bl., vi, 1859, p. 54.—Pfr., Monogr., vi, p. 364; Novit. Conch., p. 440, pl. 97, f. 33, 34 (bad).—Crosse, J. de C., 1891, p. 138, pl. 1, f. 7, 7 a (not good).—??? *C. petiveriana* Sowerby, Conch. Icon., xx, pl. 13, f. 114 (bad).

Besides the differences given under *A. eximia,* this species differs from that in the sharper striation below the basal keel. The sutural dark spots are less developed, the sculpture being more obsolete generally. In one specimen with only 6½ whorls, collected by Mr. Henderson, the apical septum is abnormal, being long and conic. The delicate pustules on the septum are frequently rubbed off.

Crosse does not seem to have noticed the chief differences between *crenata* and *eximia,* in the stronger basal keel and smaller mouth of the latter.

It is impossible to tell whether the rude figures referred to by Férussac under his *H. petiveriana* were drawn from *eximia* or *crenata.* Sowerby's figure is equally dubious.

UROCOPTIS.

U. cylindrus (Chemn., Desh.). Page 137. *Pupa violacea* Swainson, Exotic Conchology, 2d edit., by S. Hanley, p. 39 (1841), is undoubtedly *U. cylindrus.* I have not seen the original edition of "Exotic Conchology," which appeared in 1821-22. If the description of *P. violacea* appeared therein, it was the first adequate diagnosis of this fine Jamaican shell. Chemnitz's description and figures, upon which Dillwyn and Wood depend, are ambiguous, and may apply to some allied form as well as to that subsequently fixed upon by Deshayes.

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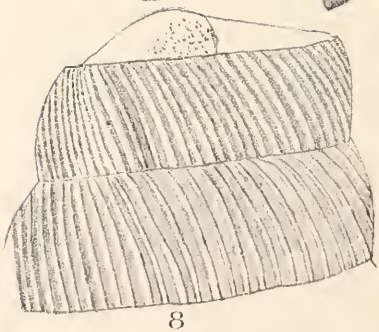
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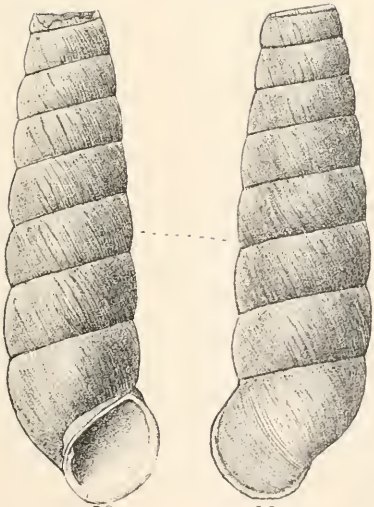
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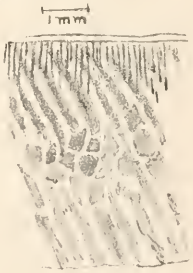

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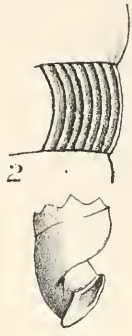

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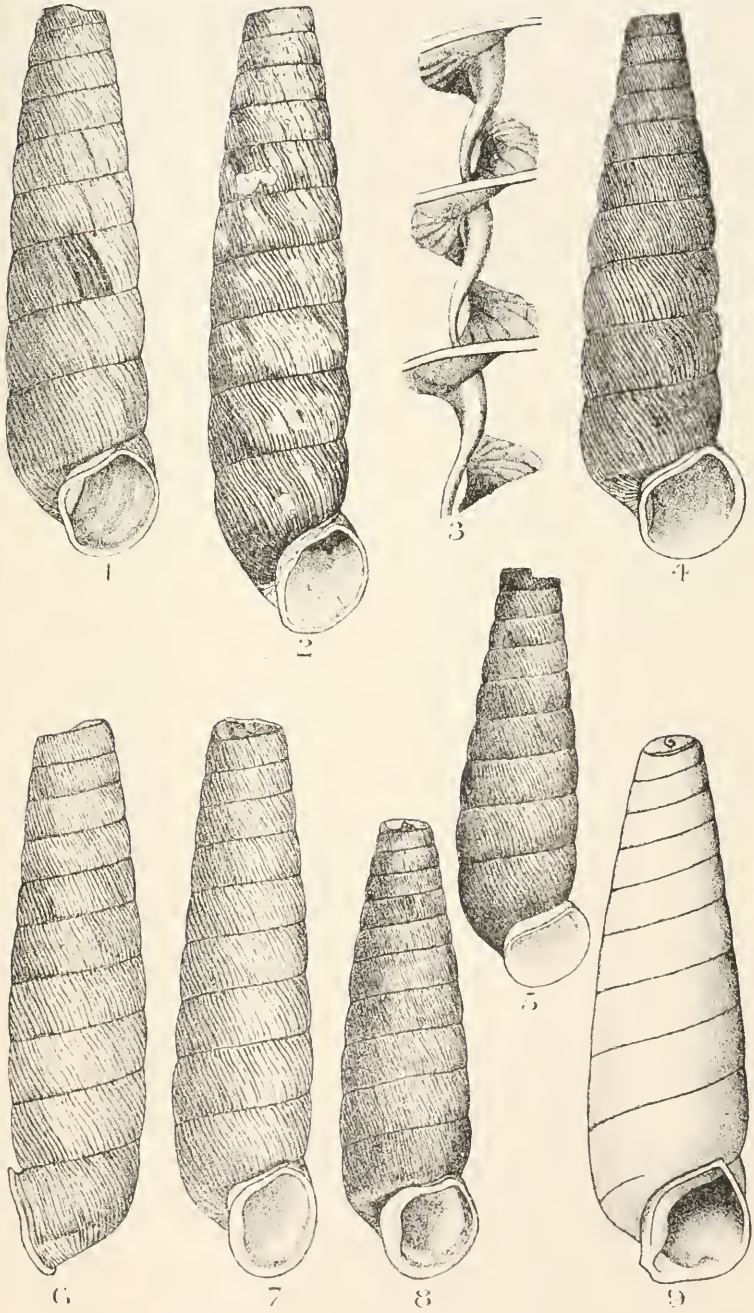
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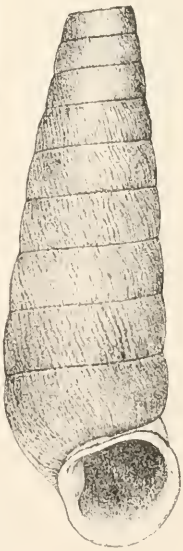

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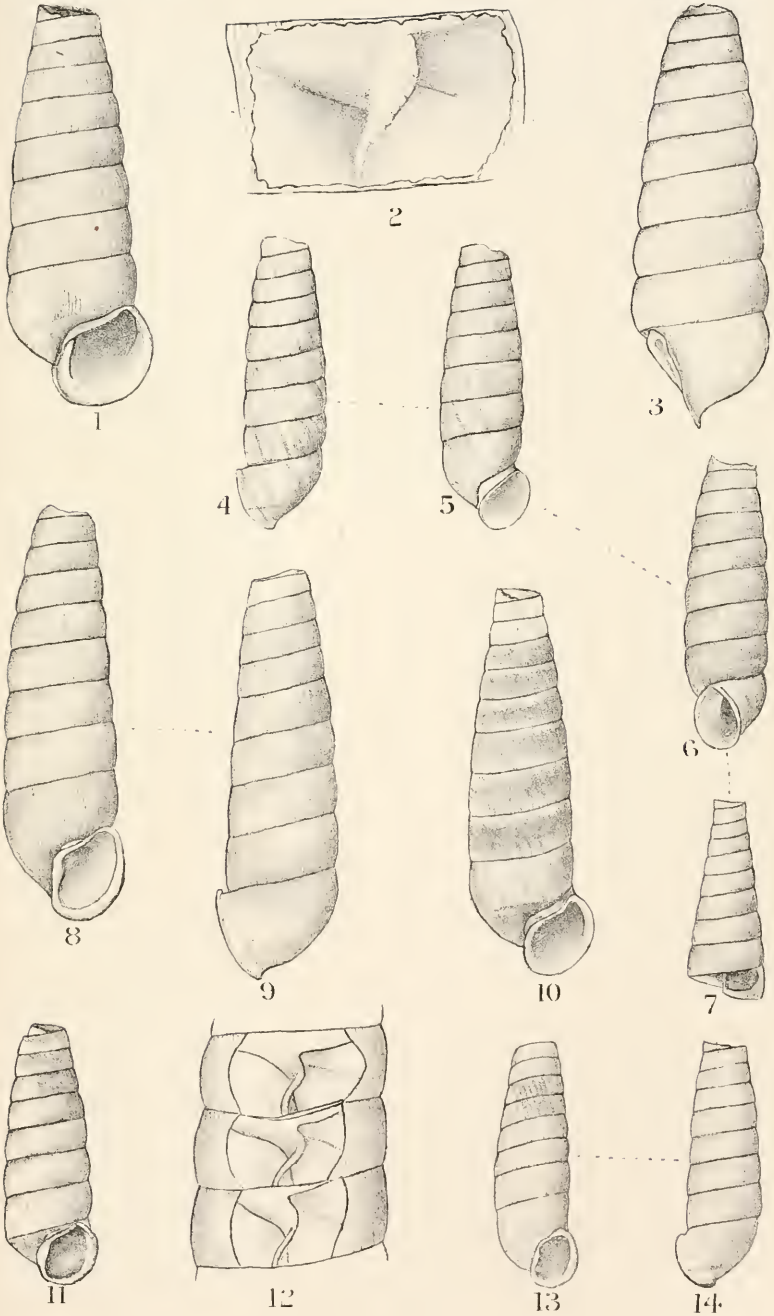

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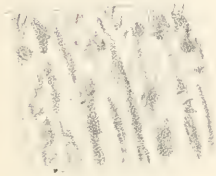

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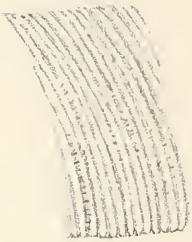

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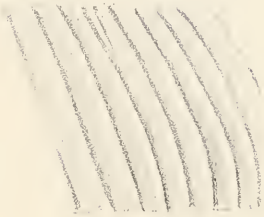

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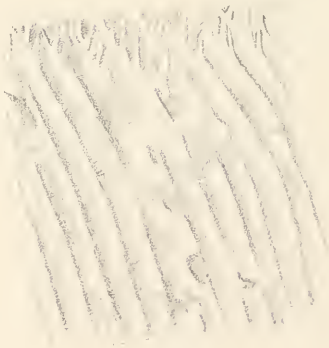

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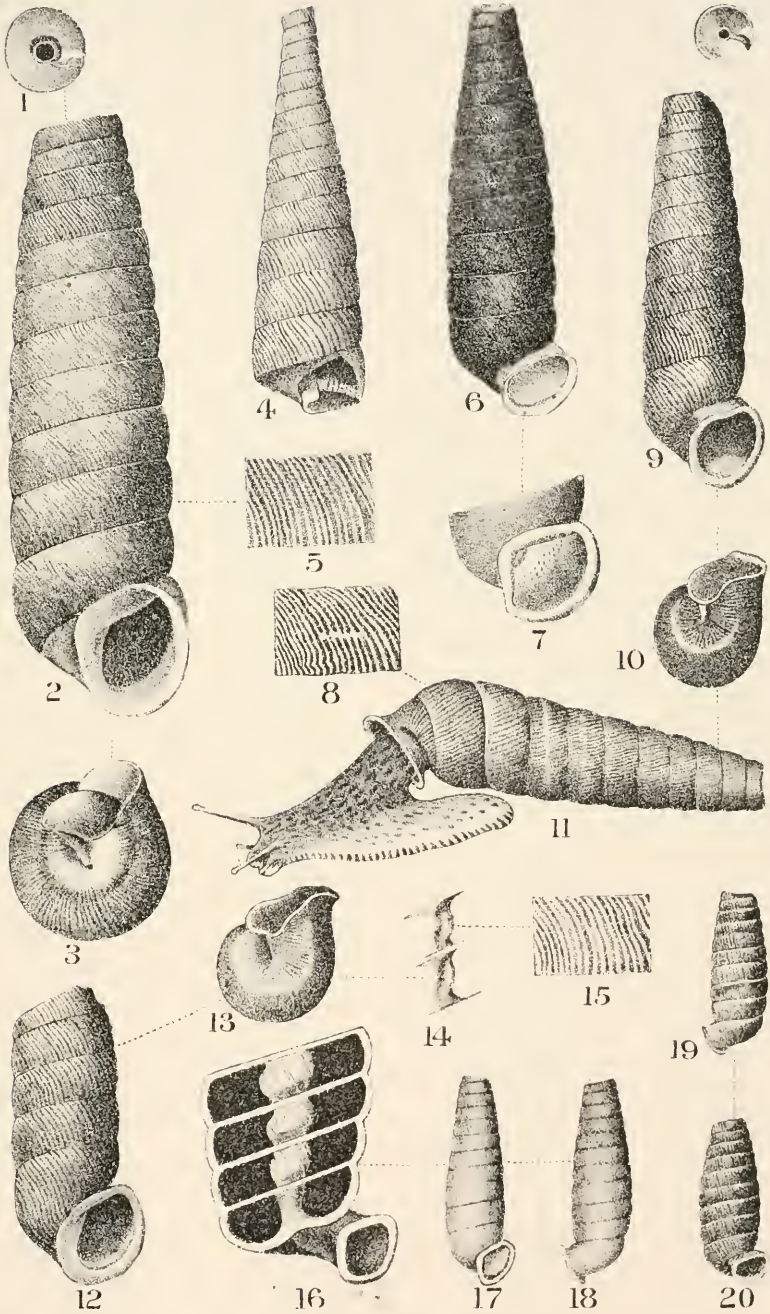
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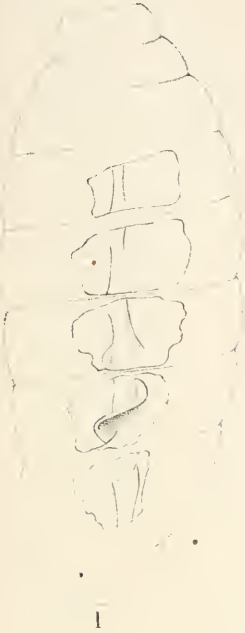

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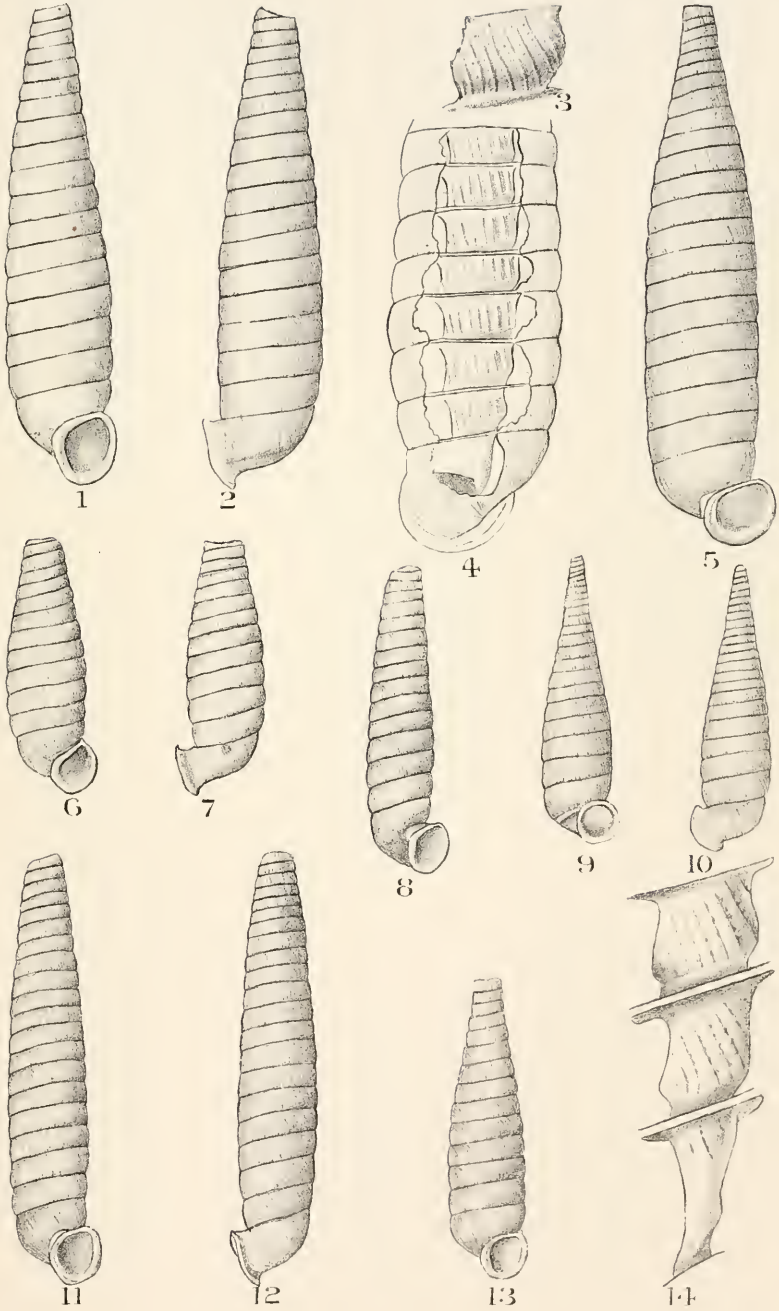
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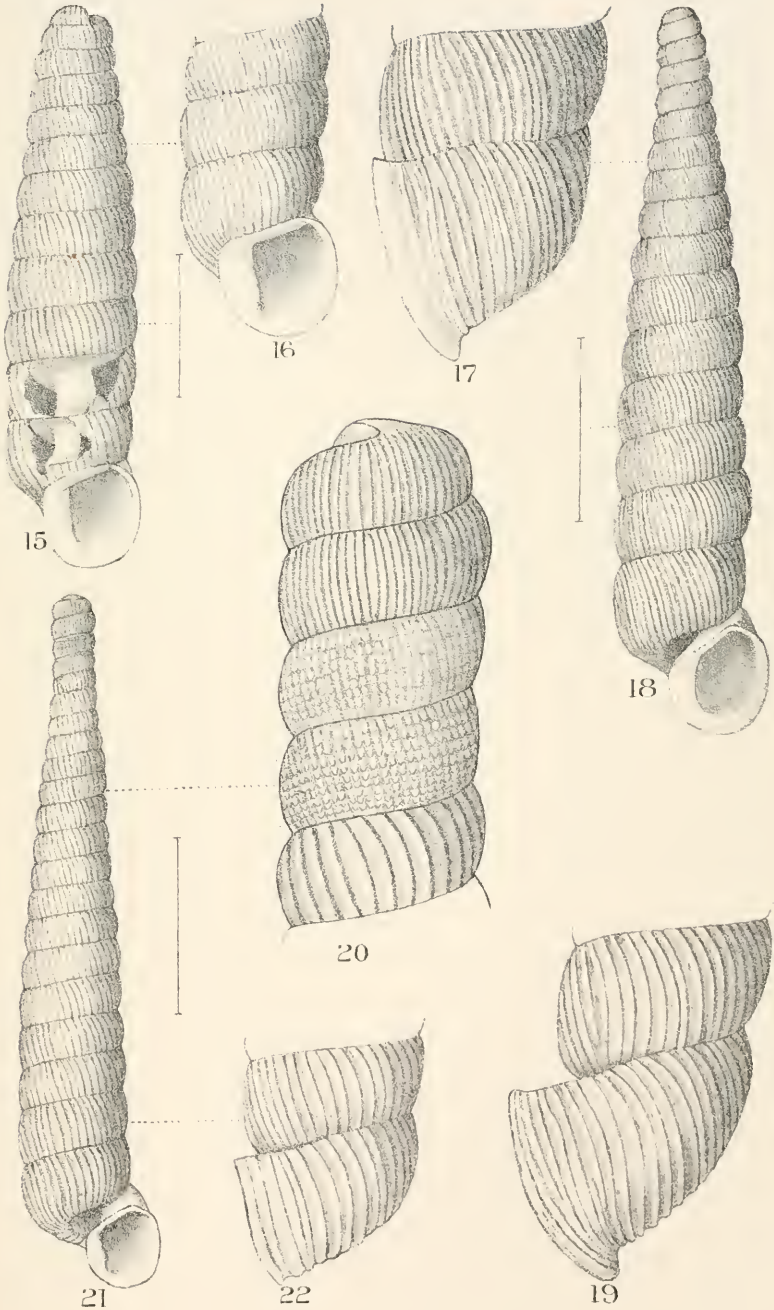
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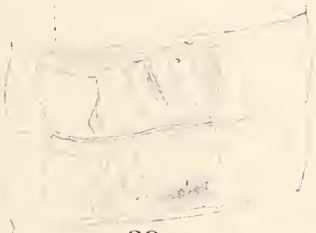
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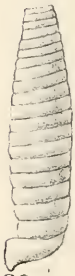
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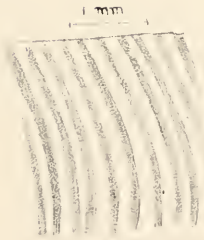

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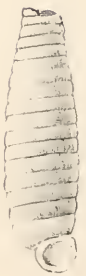
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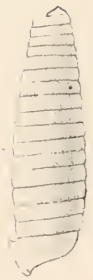
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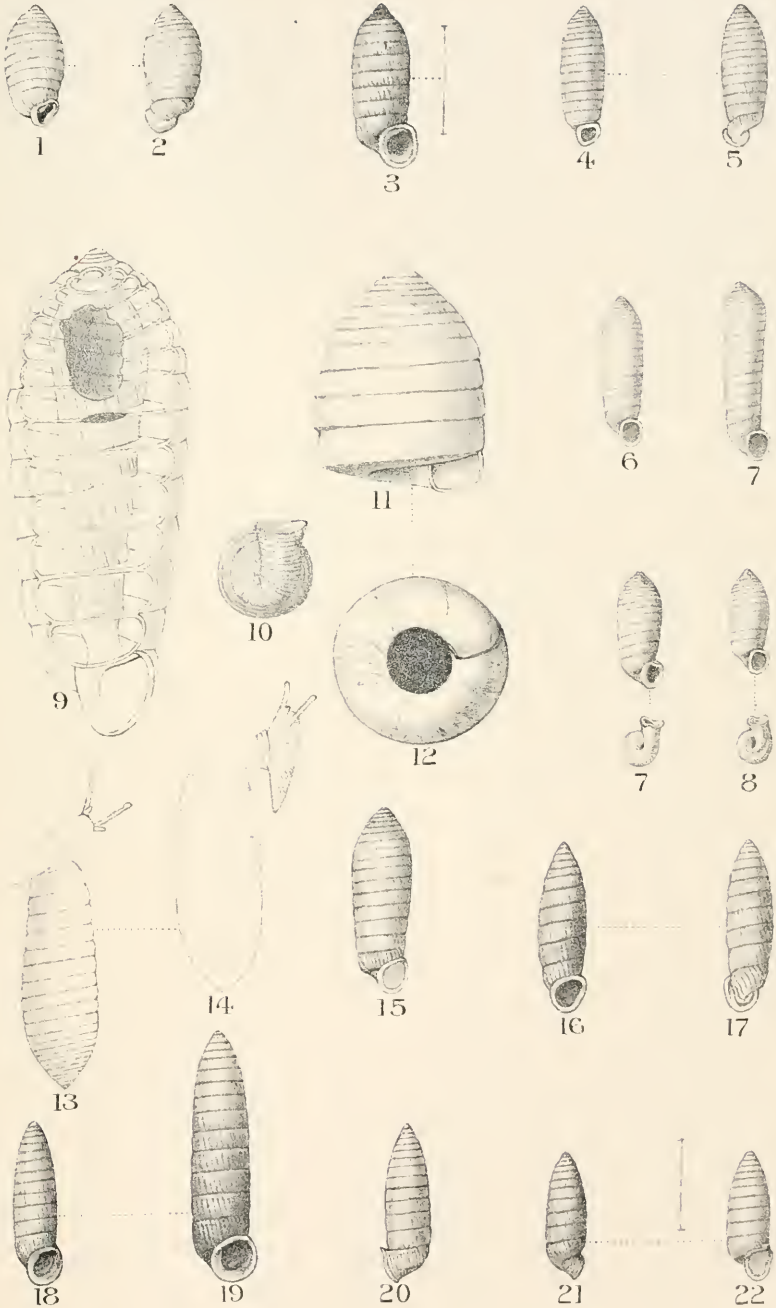
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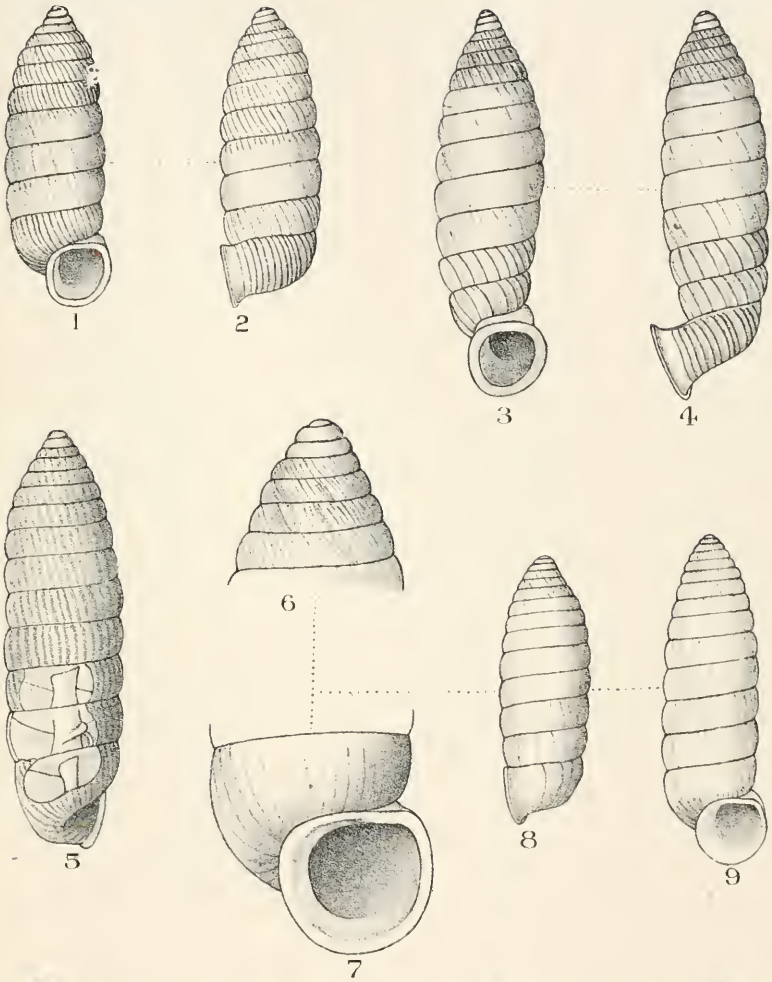
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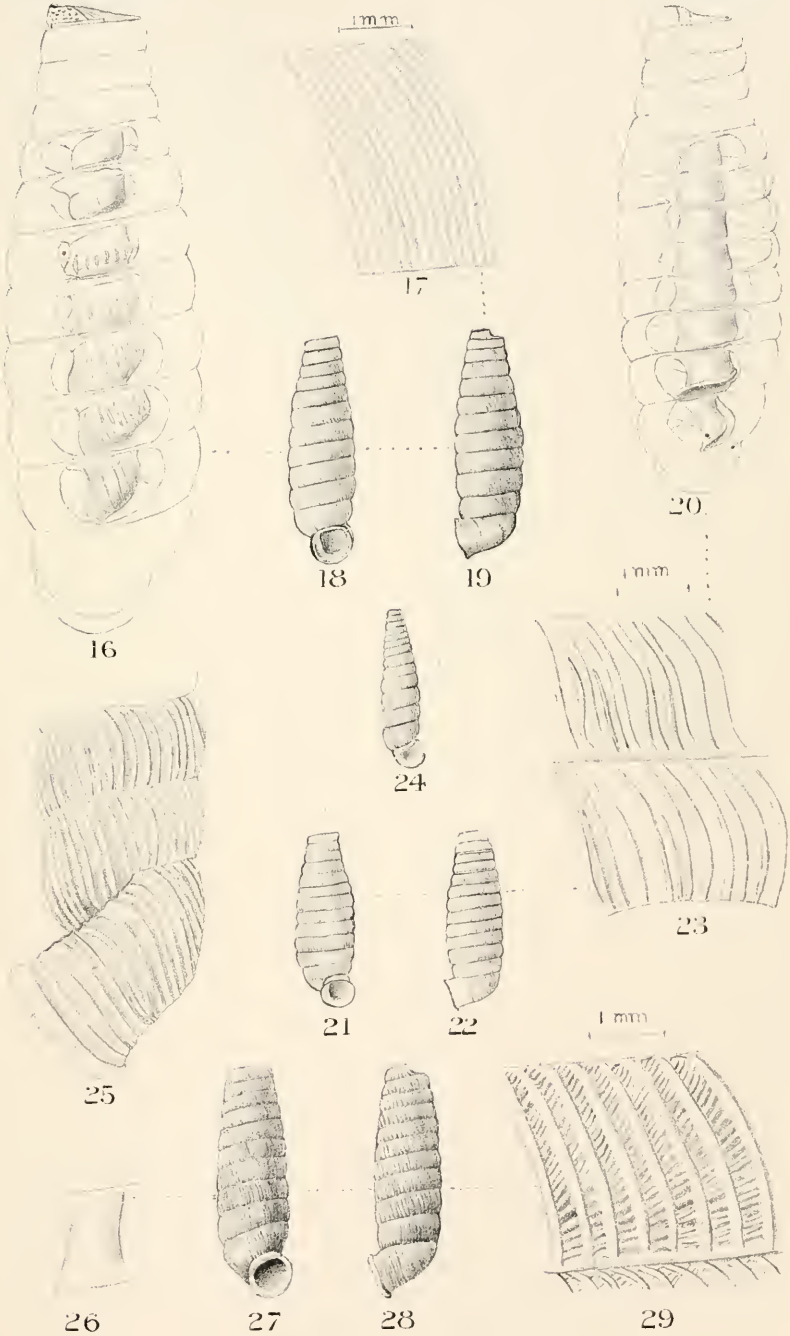
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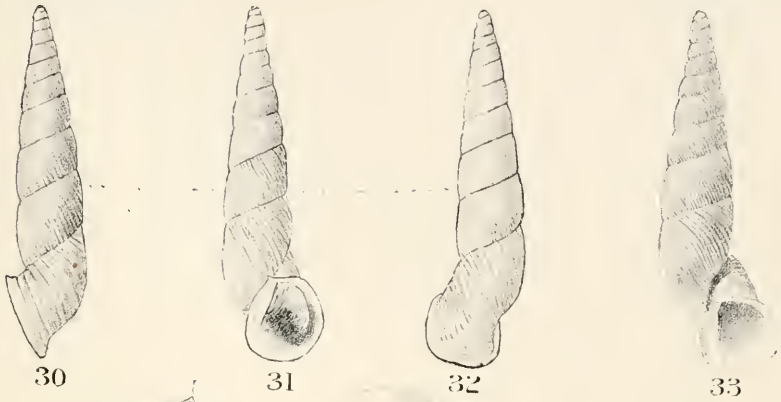

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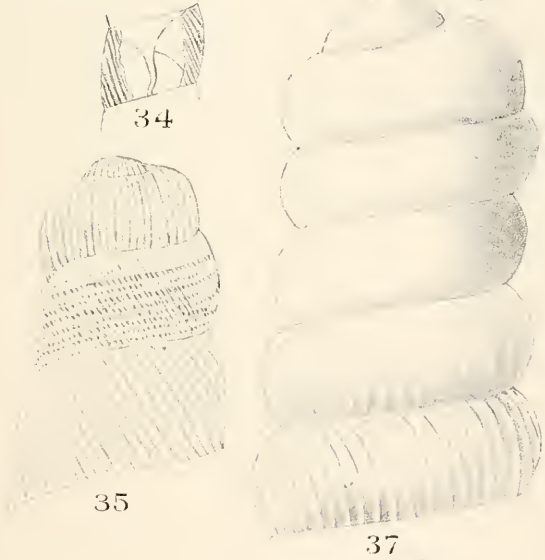

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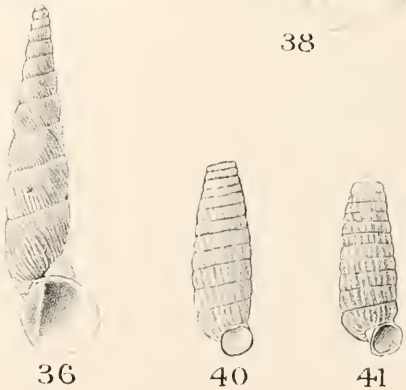

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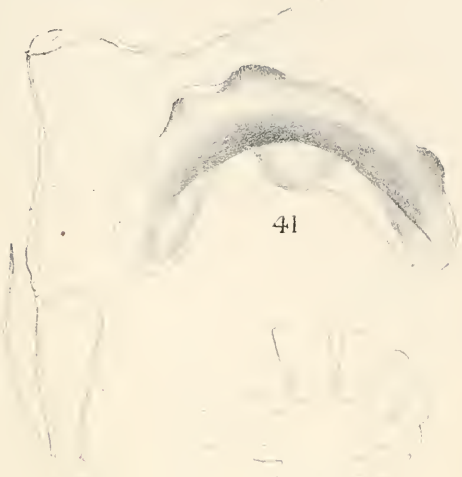

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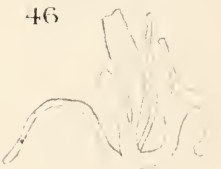

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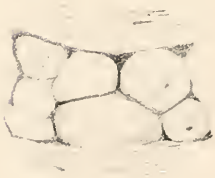

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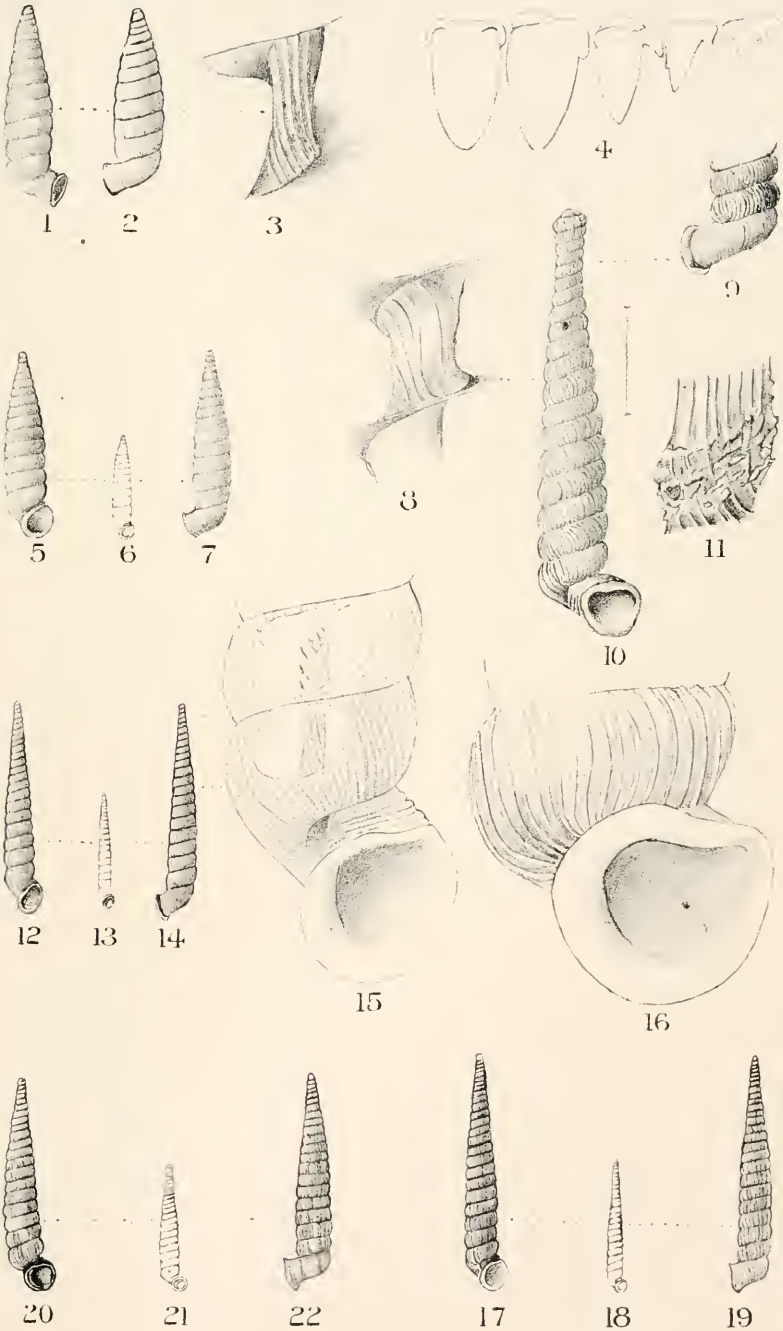
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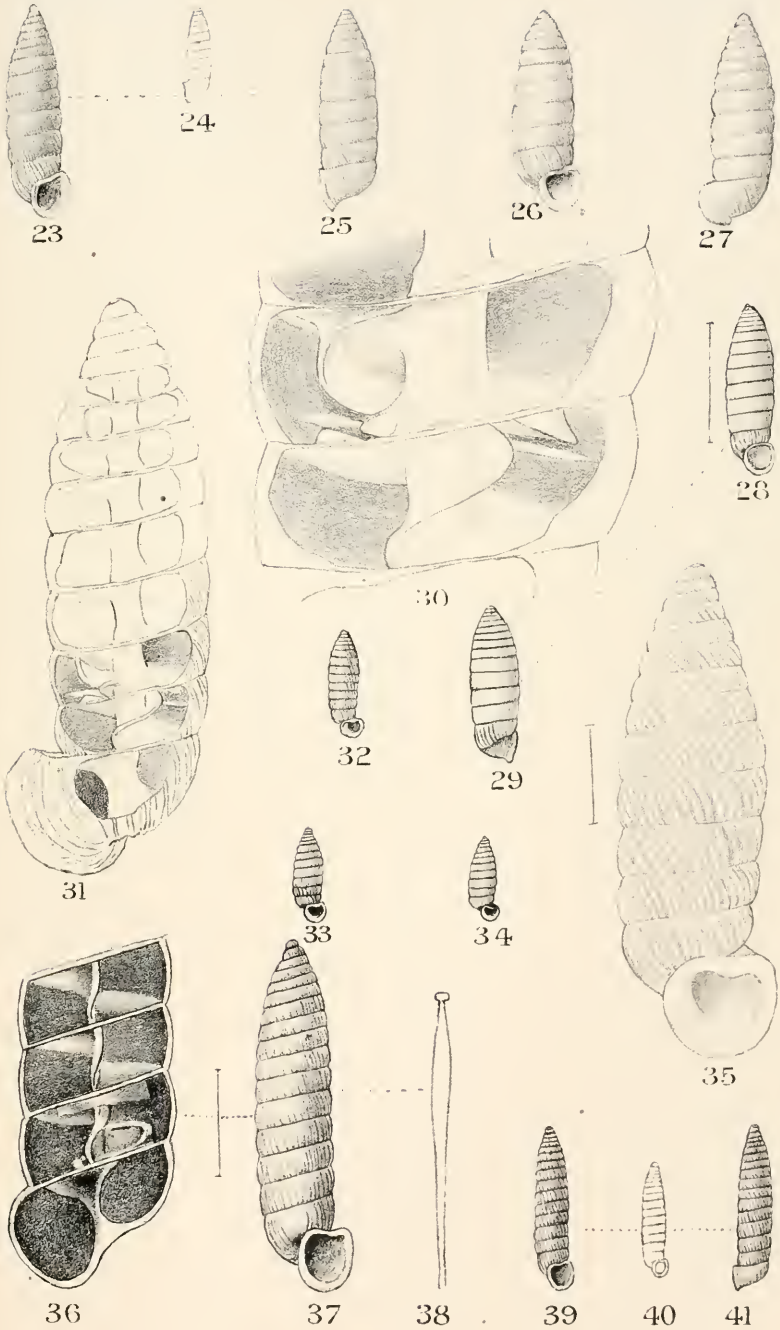
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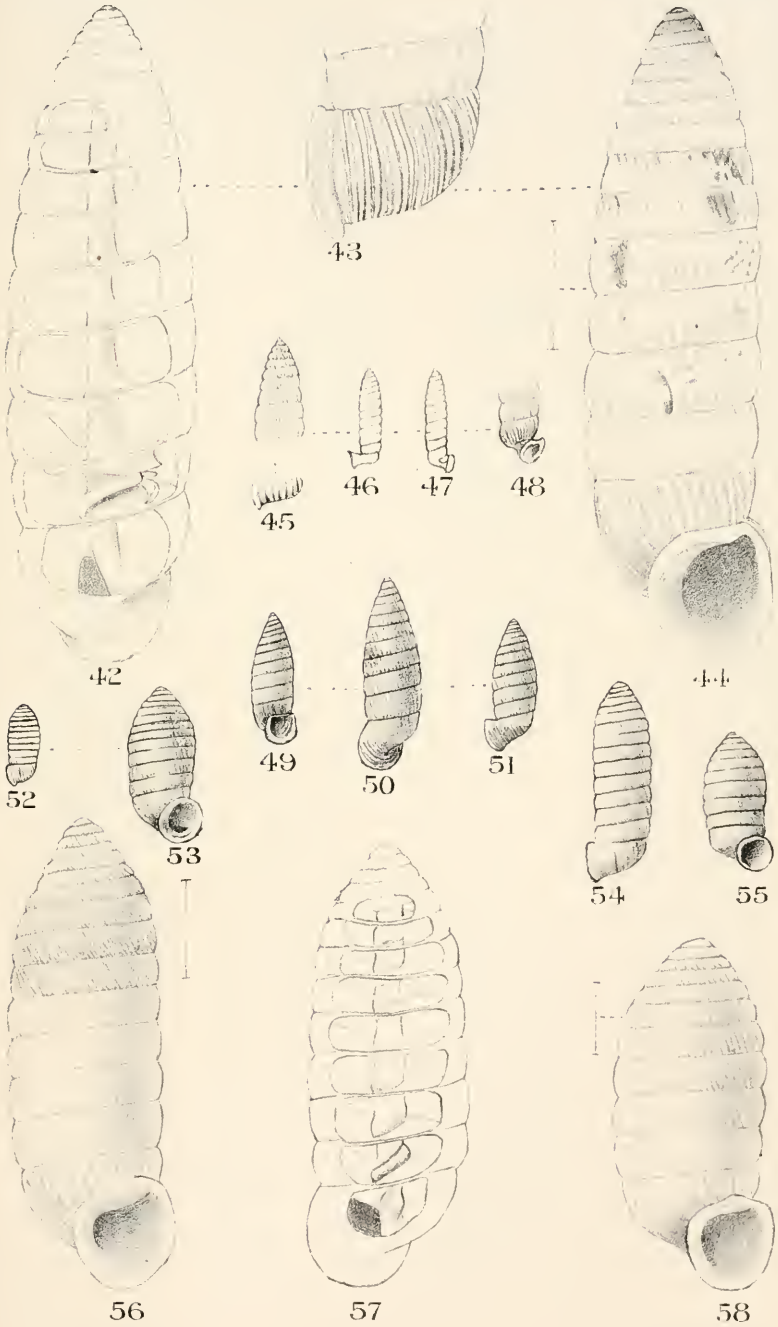
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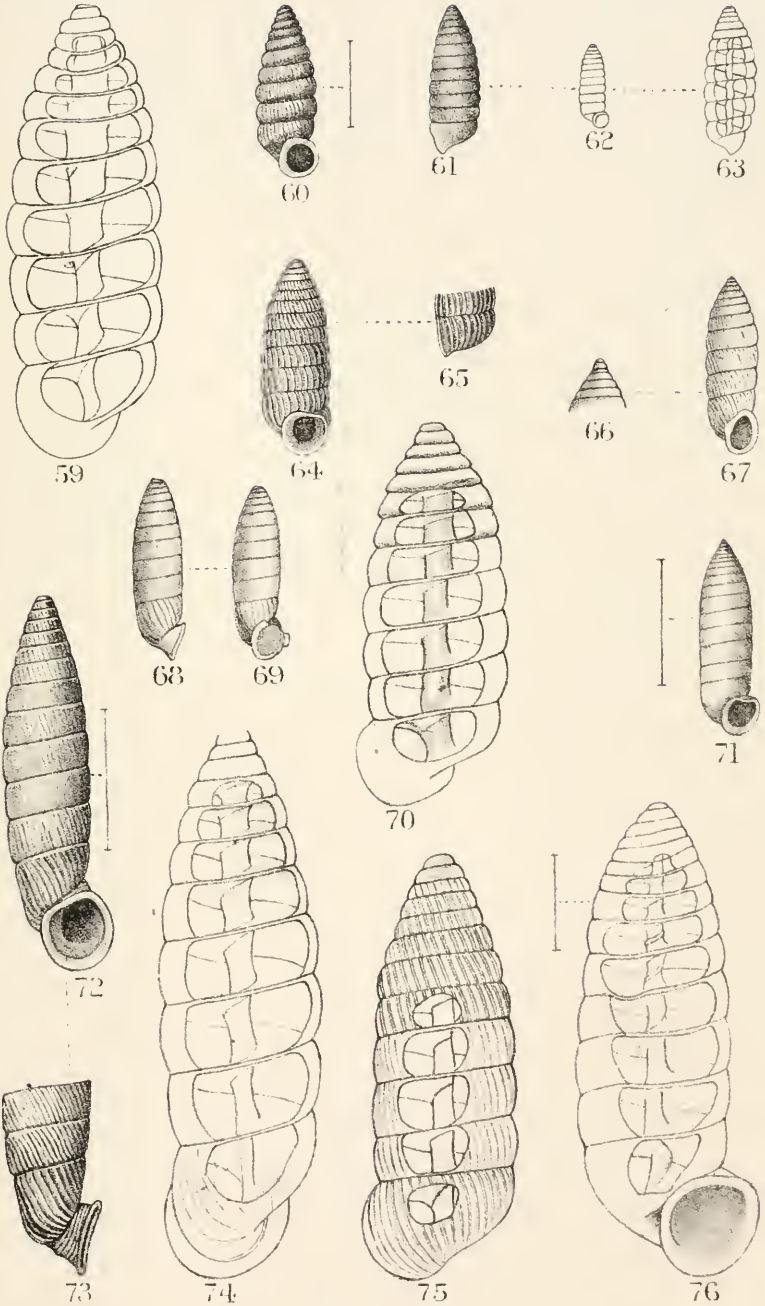
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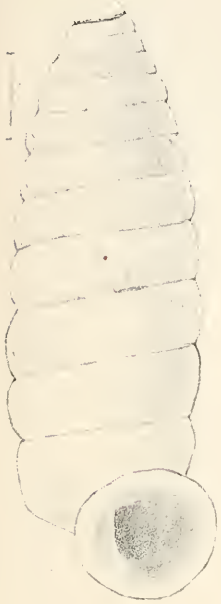

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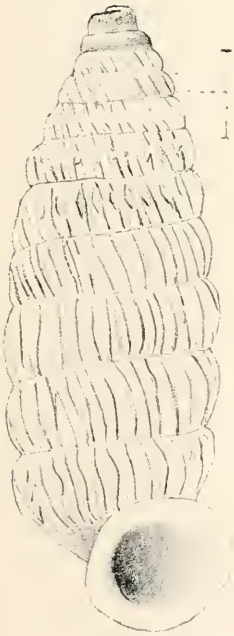

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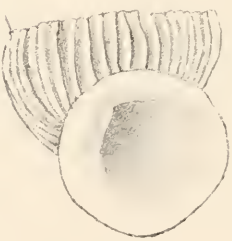

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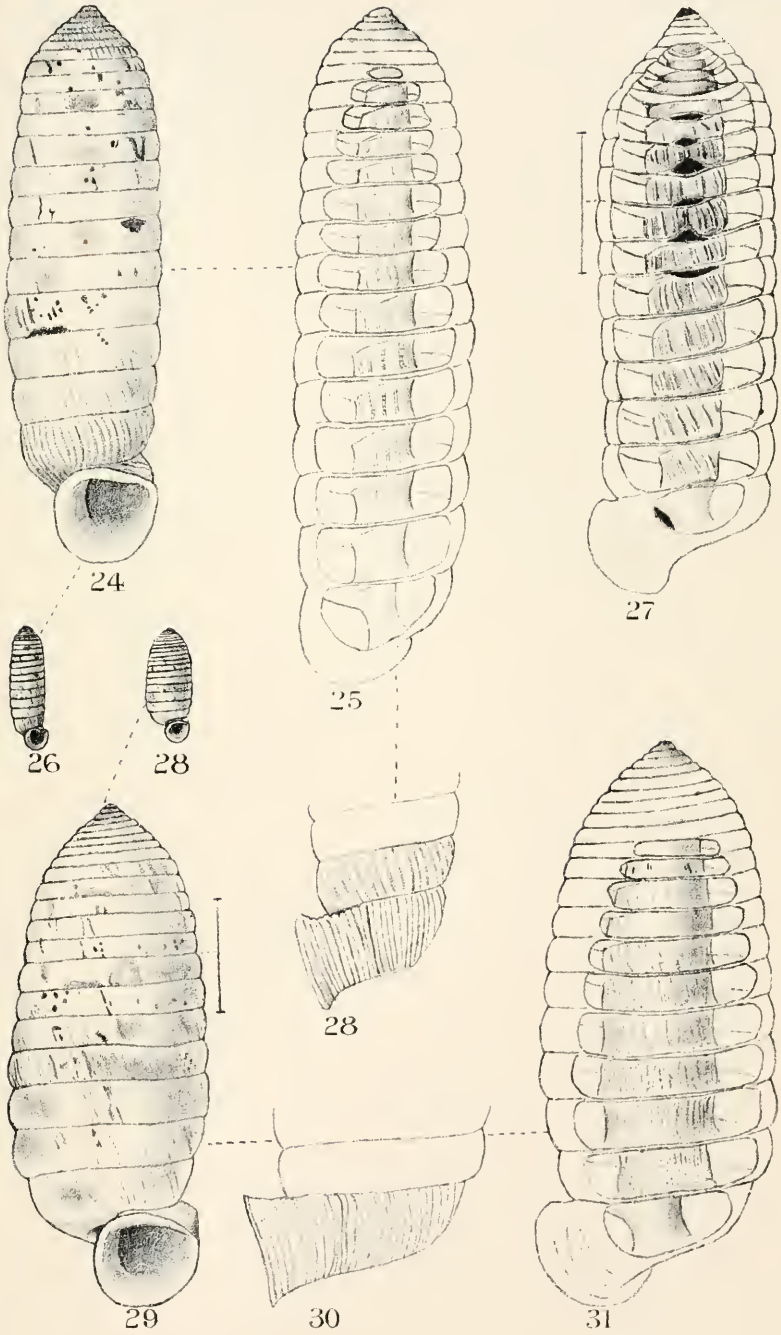
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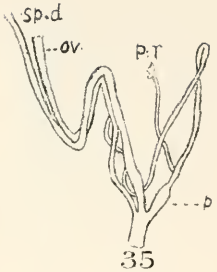

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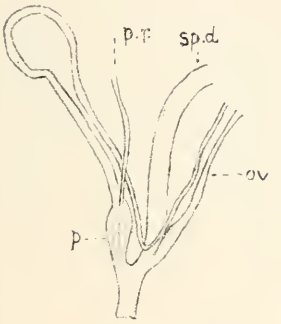

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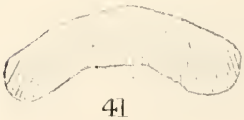
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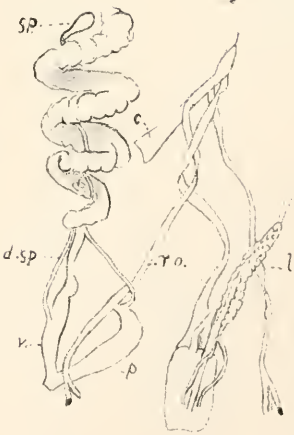

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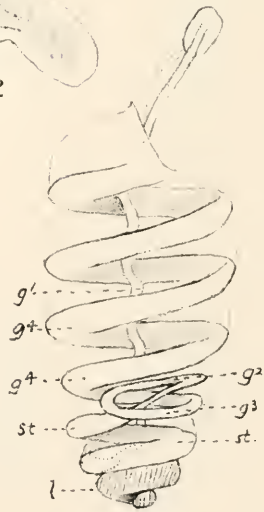

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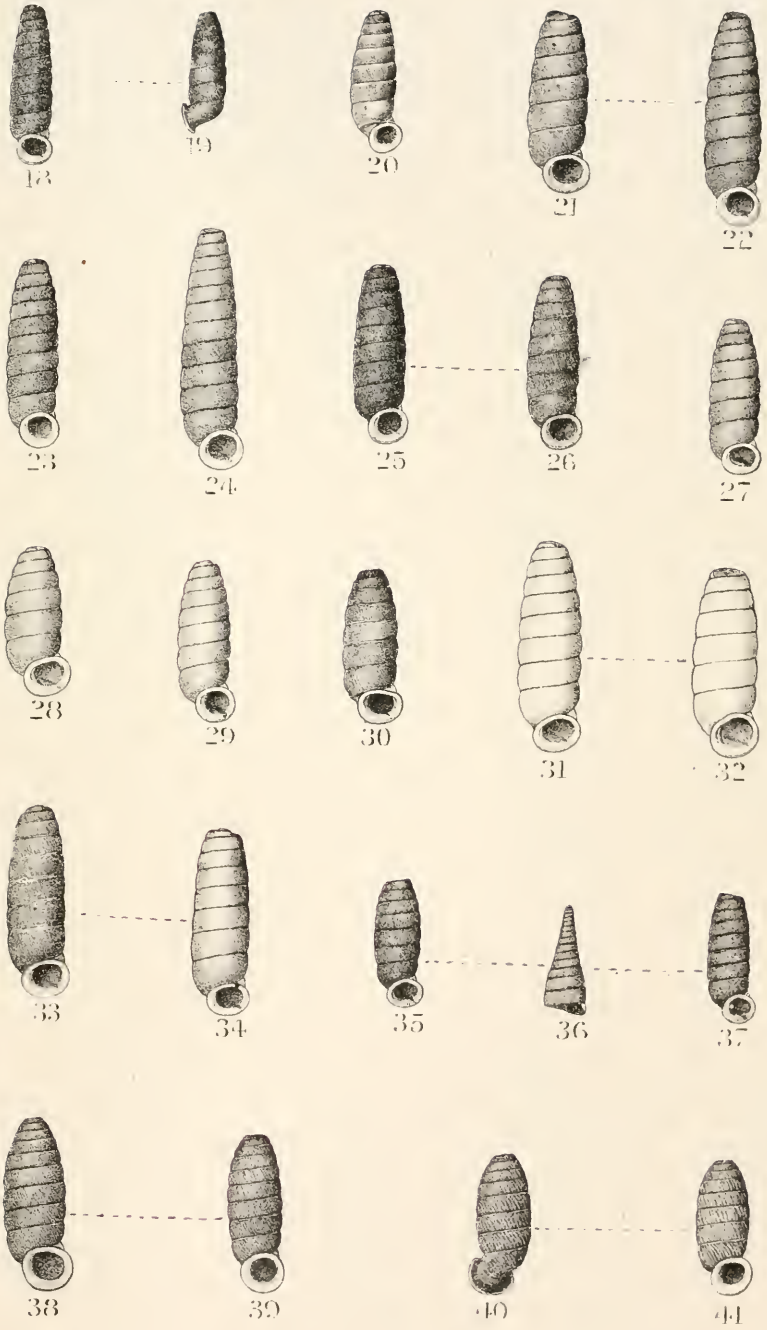
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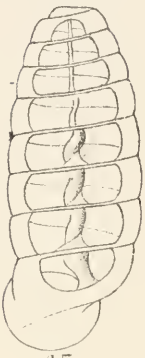
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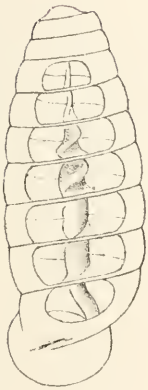
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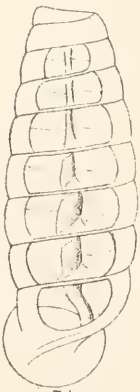
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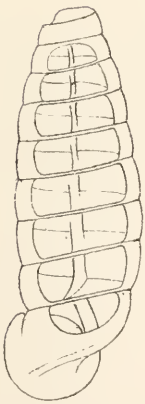
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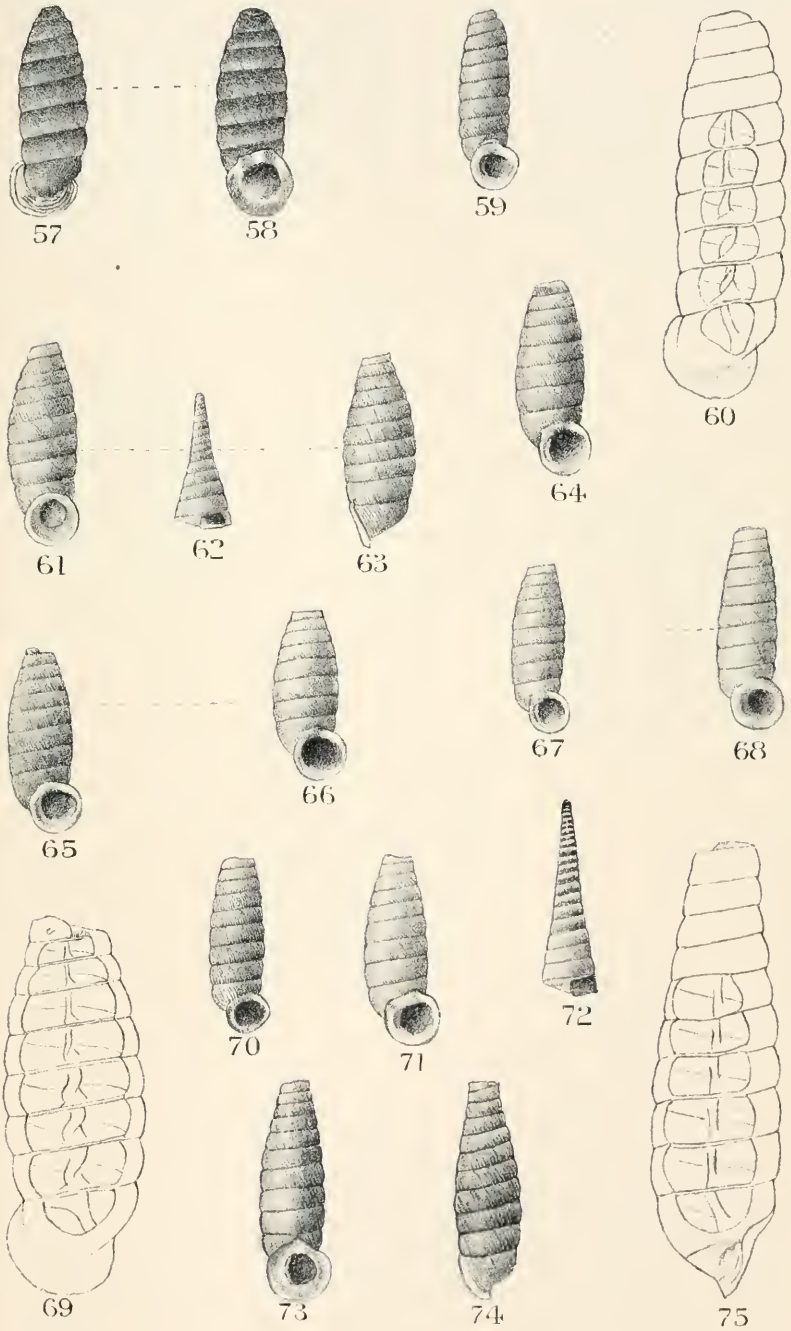
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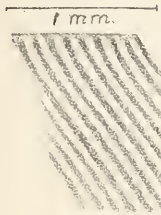

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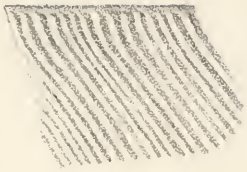

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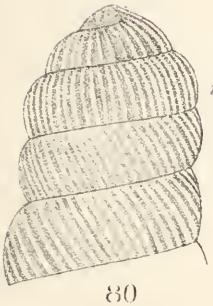

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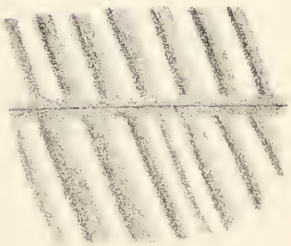

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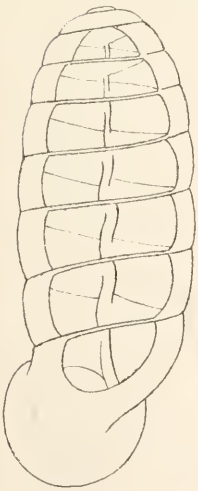

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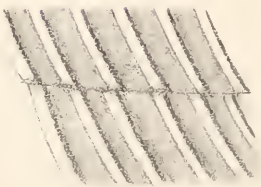

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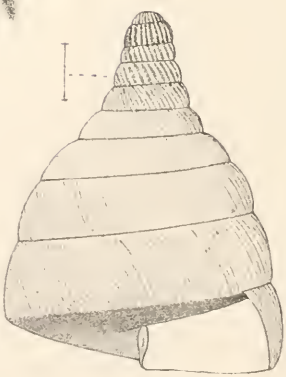

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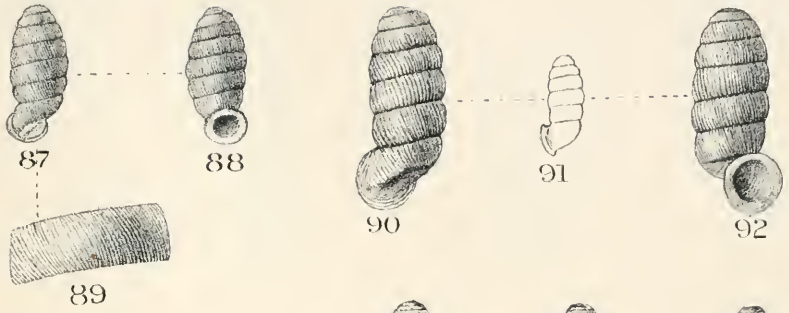
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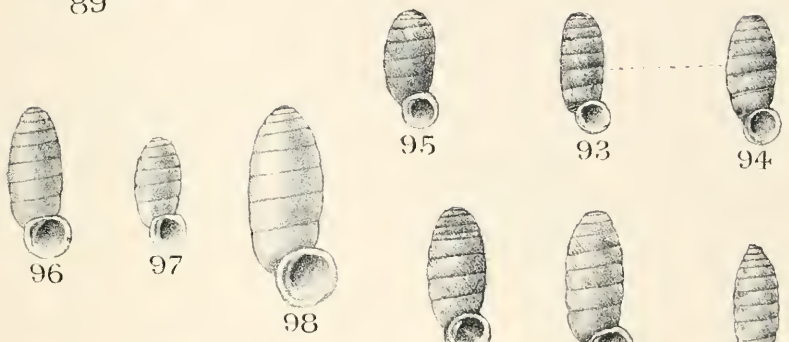
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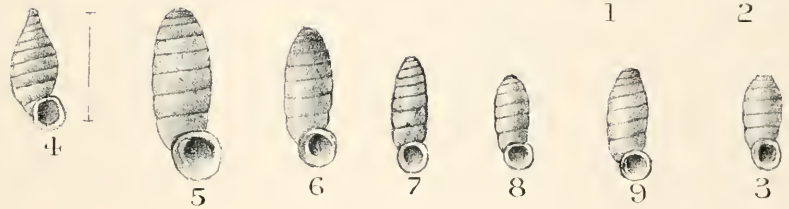
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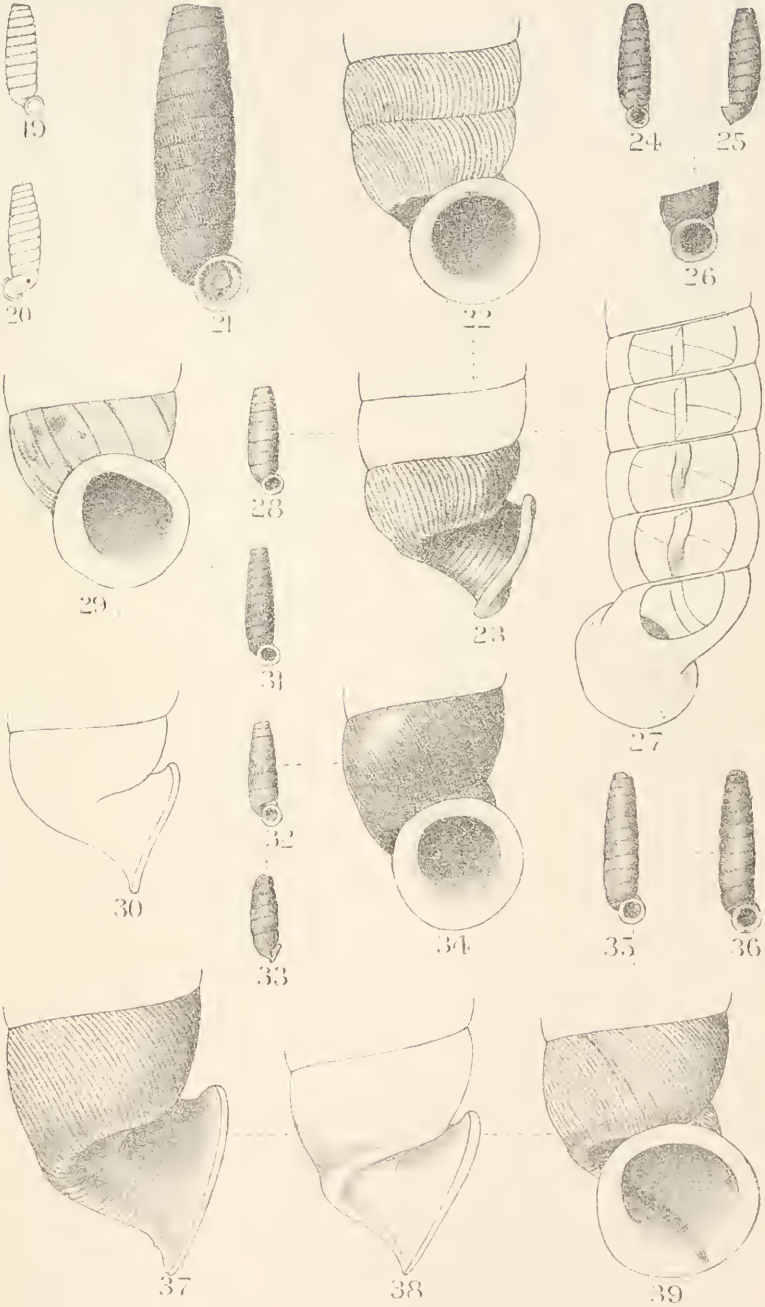
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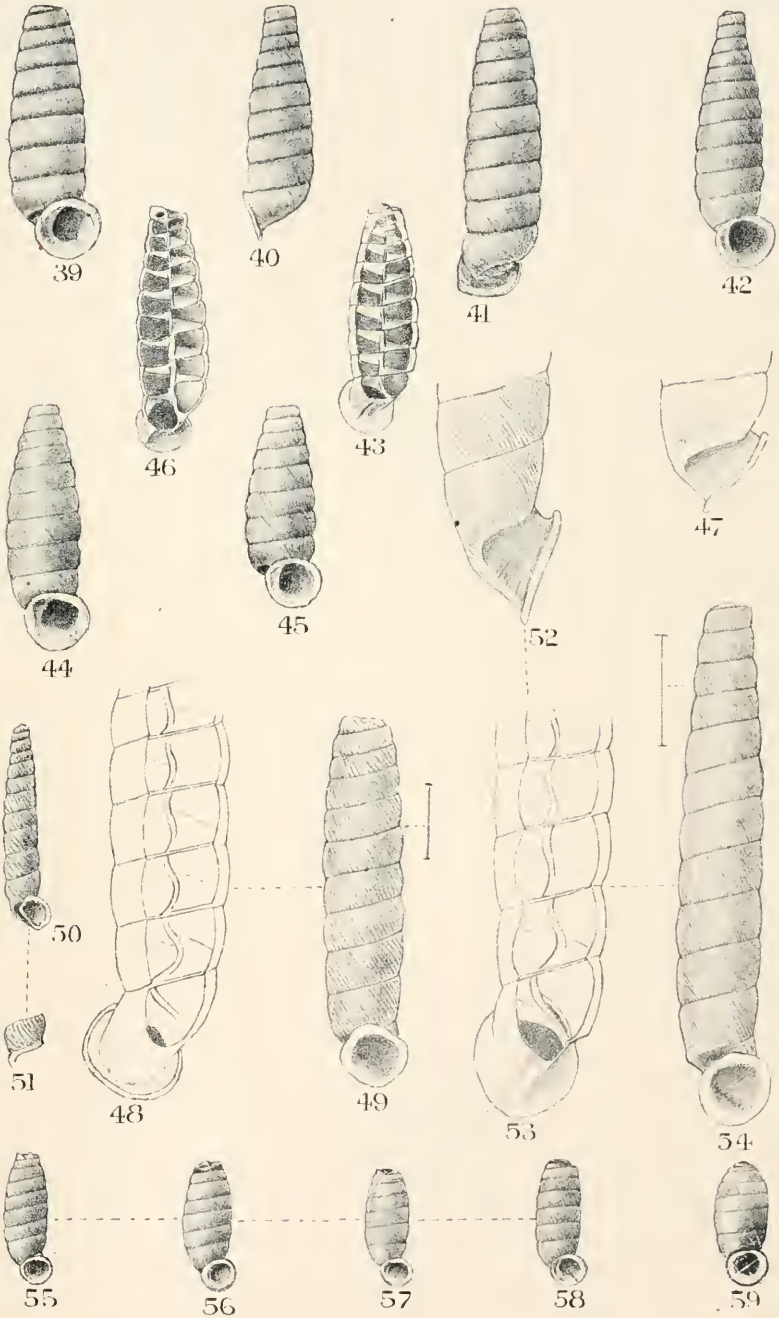
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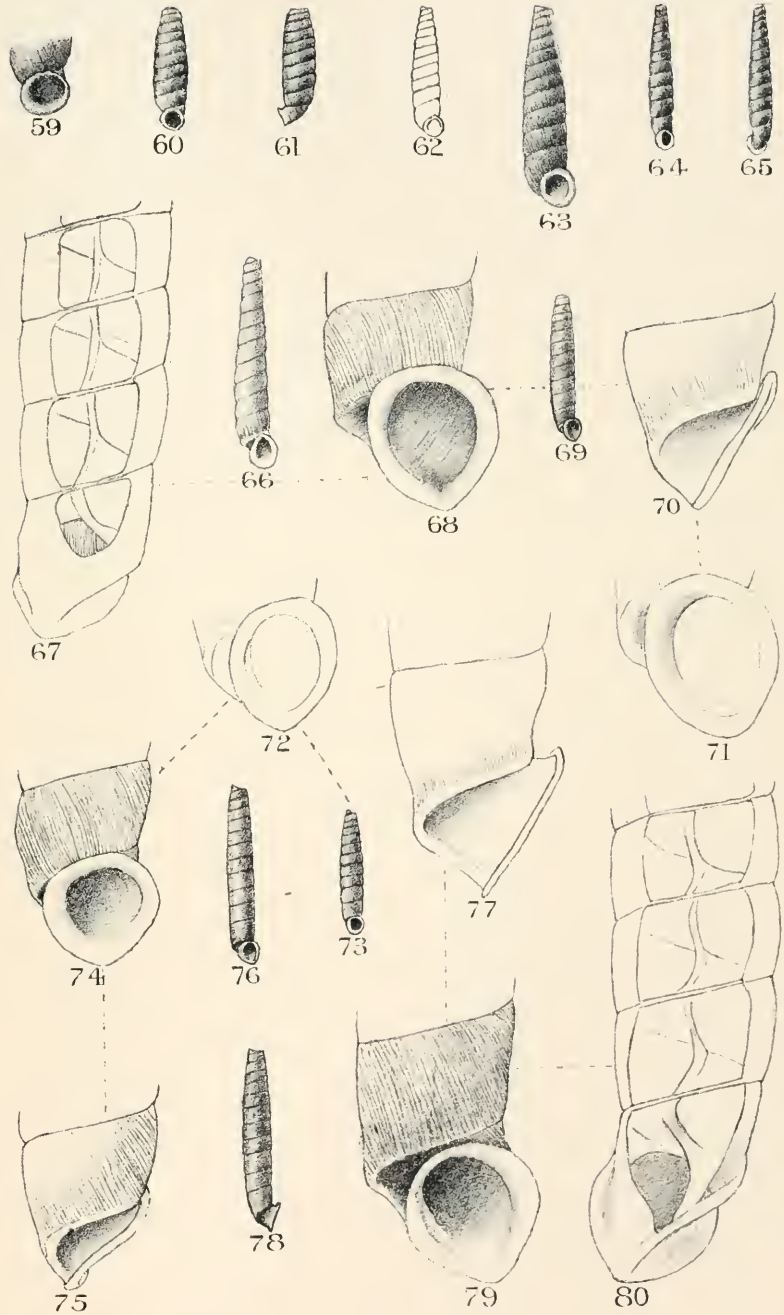
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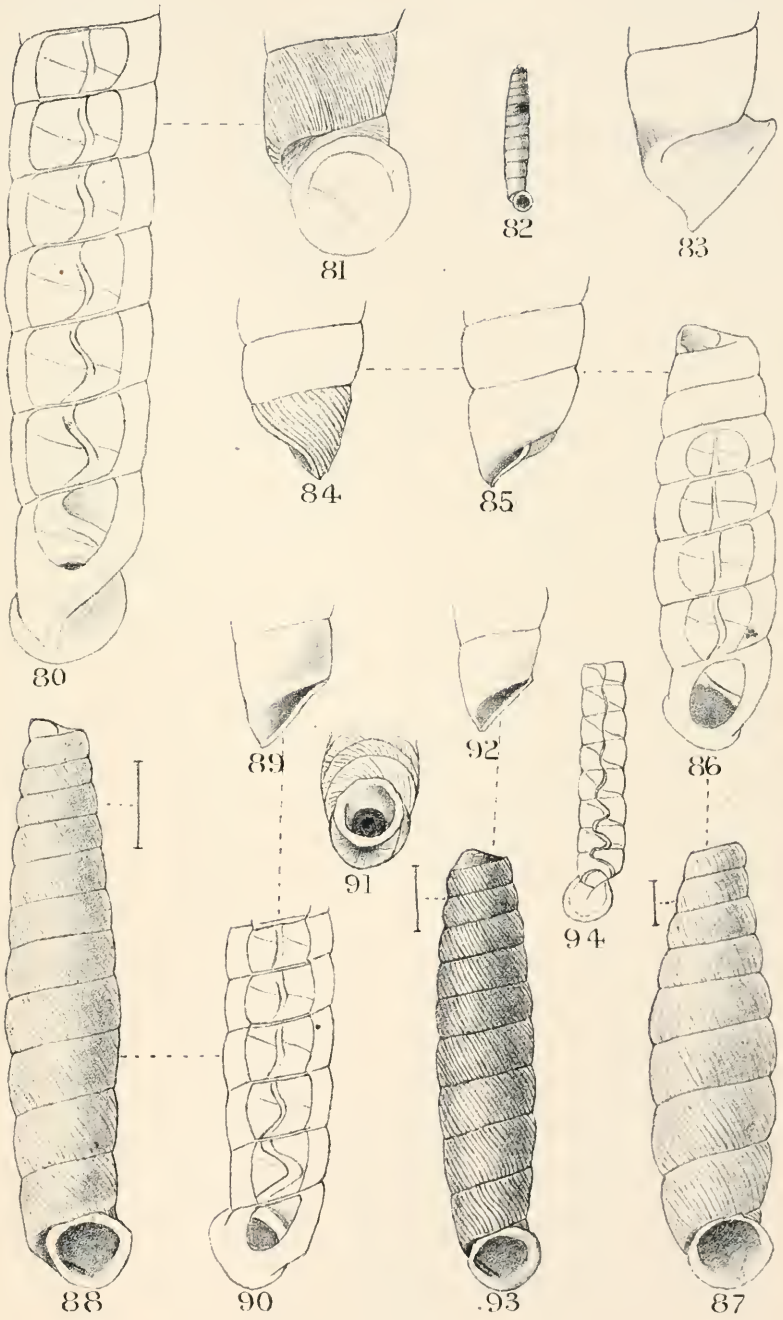
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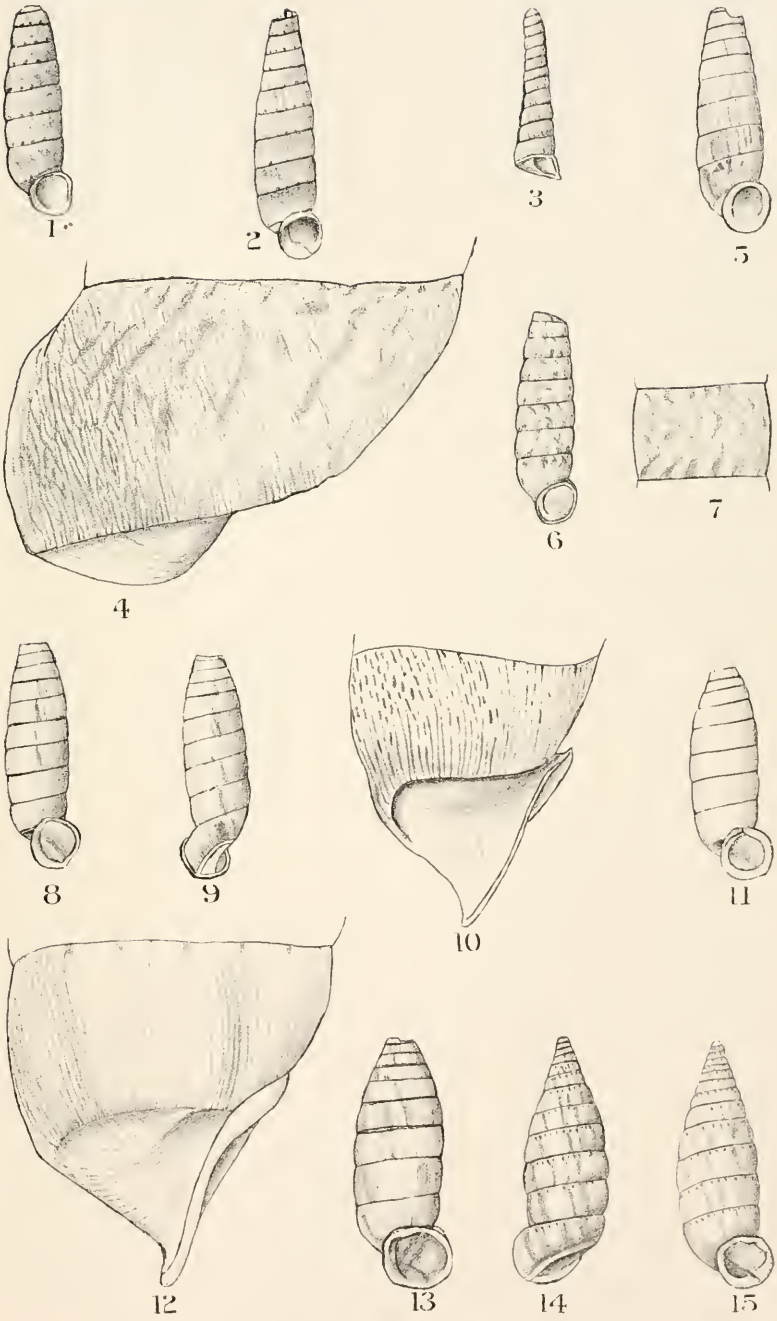
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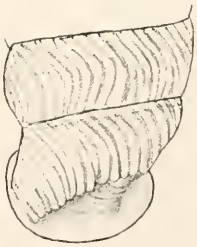
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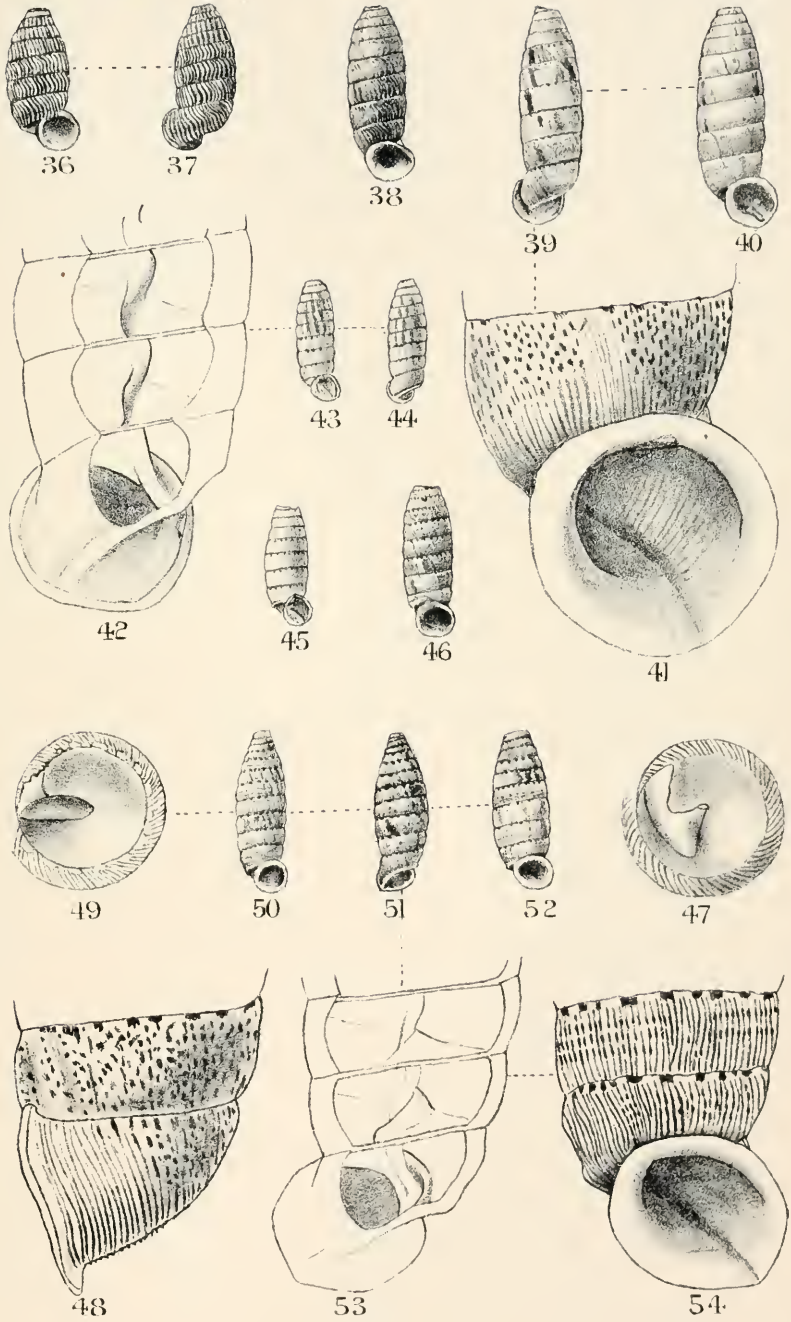
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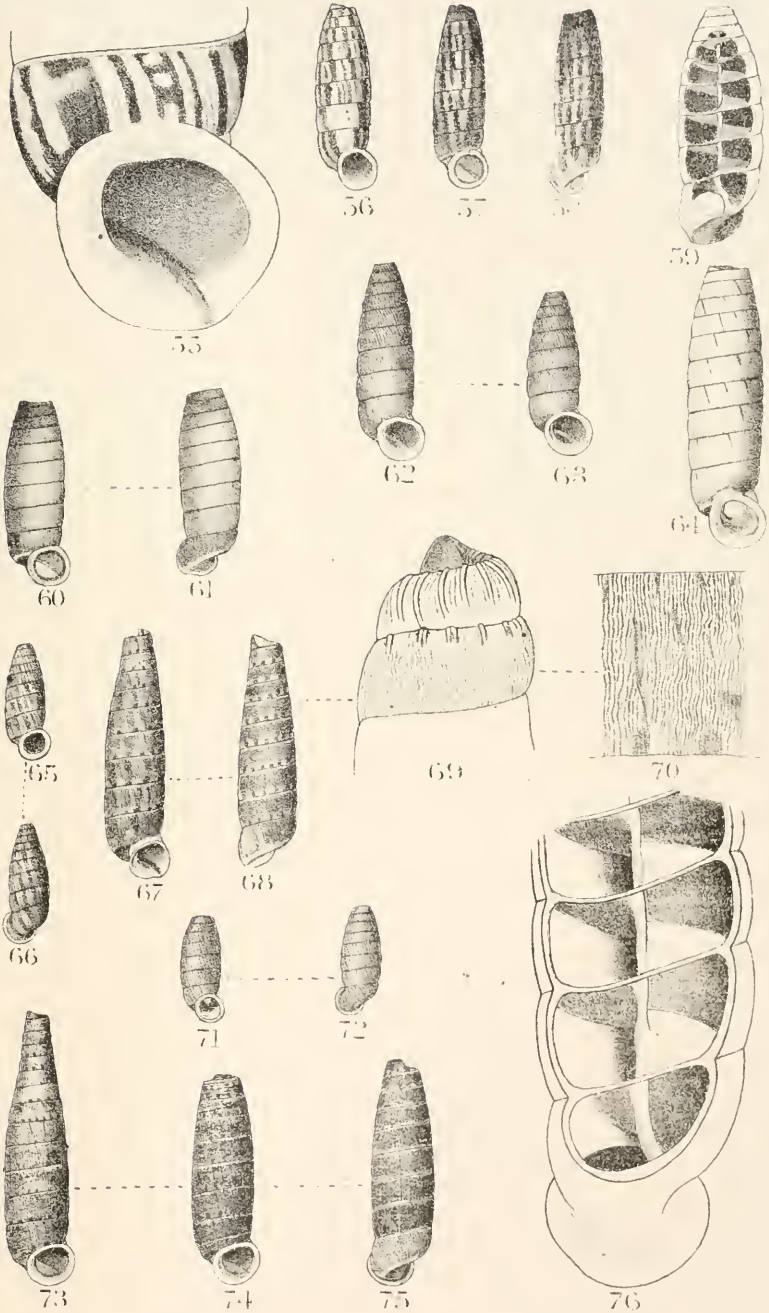
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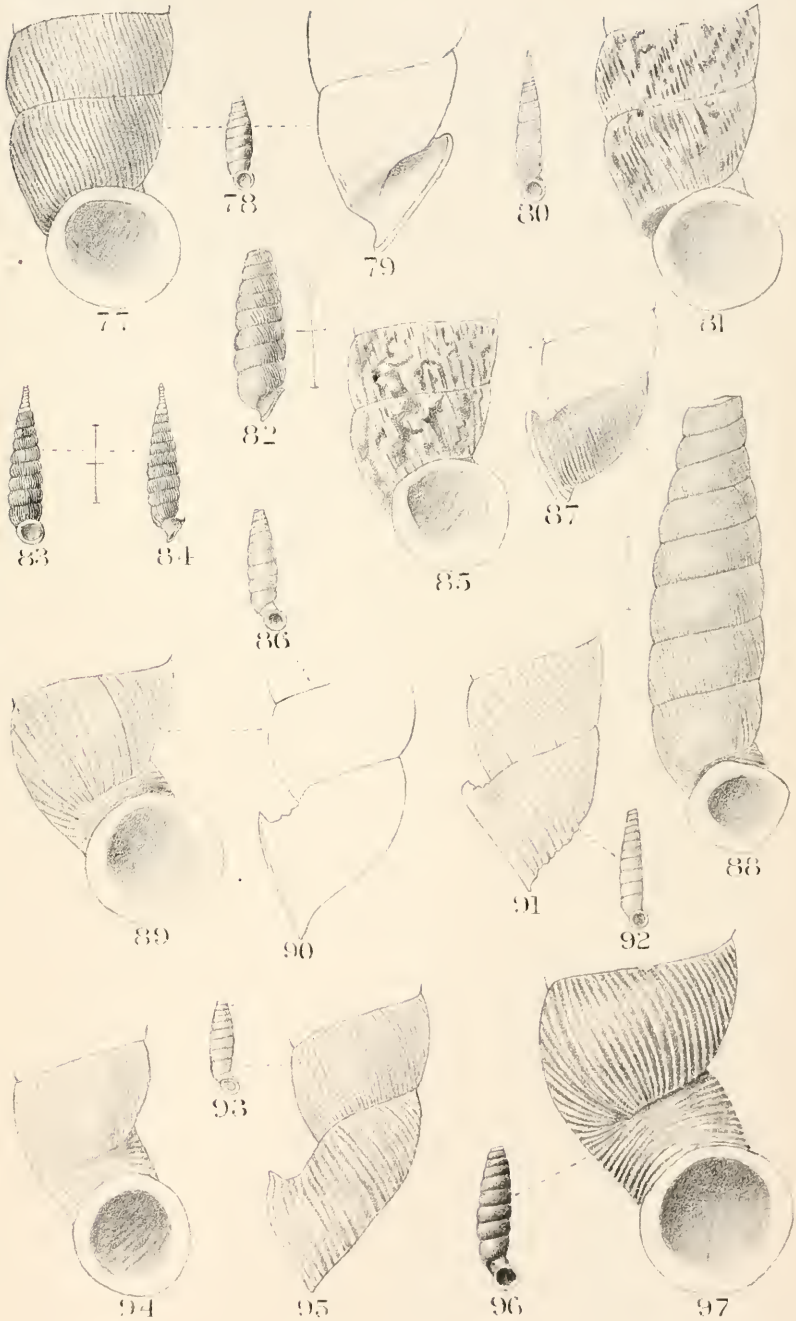
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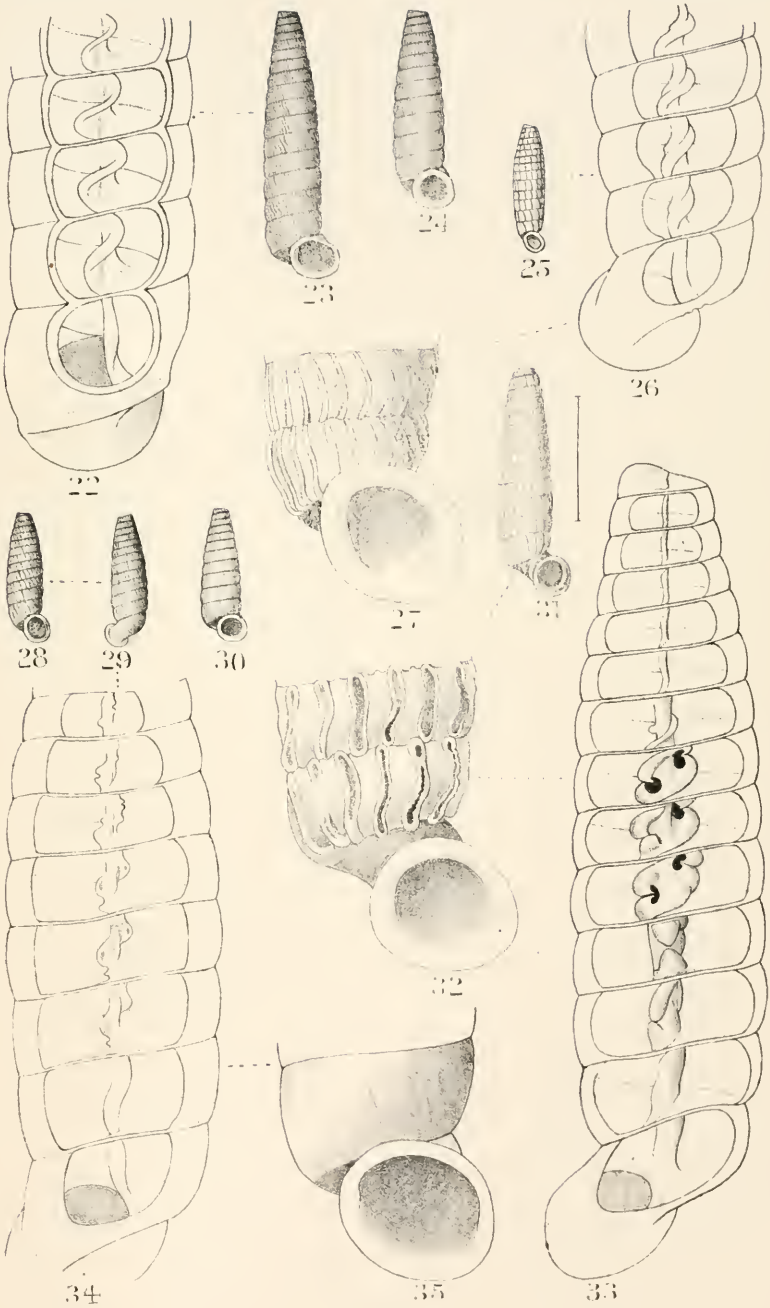
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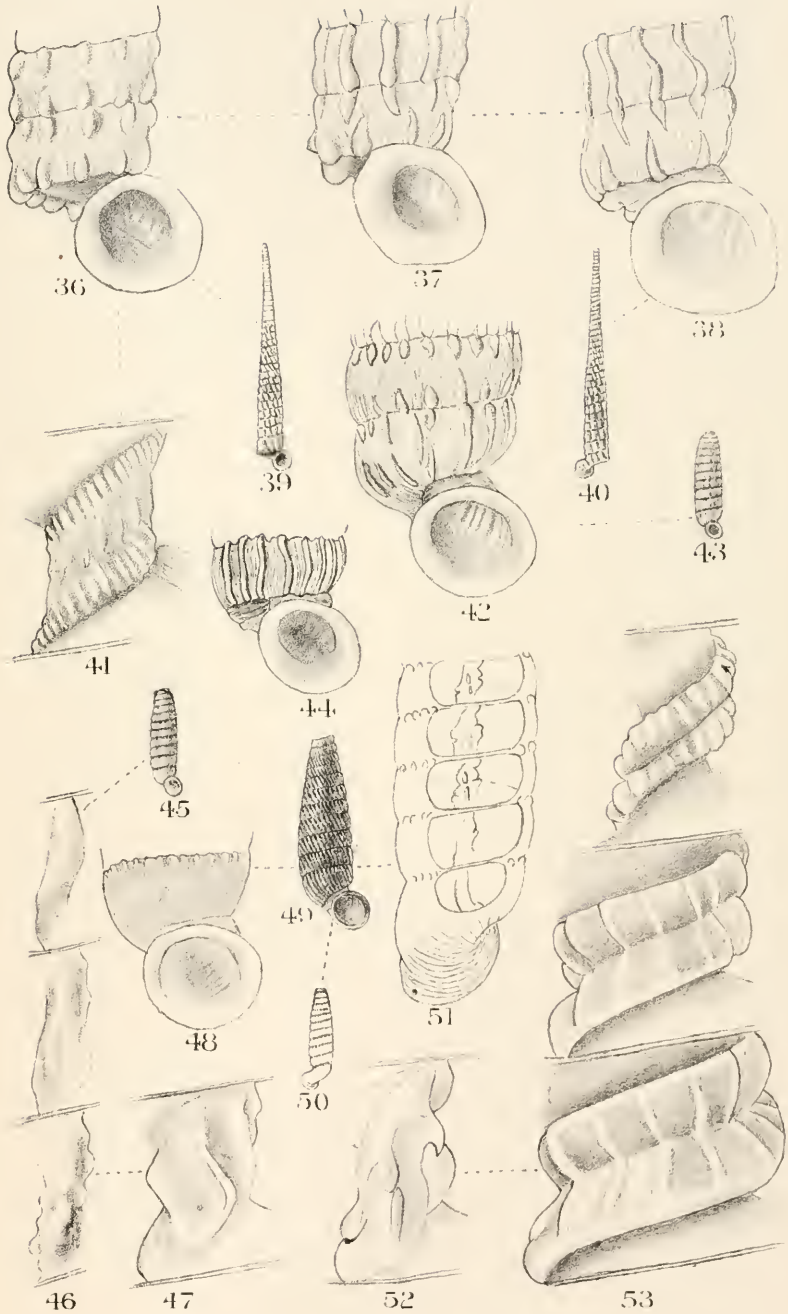
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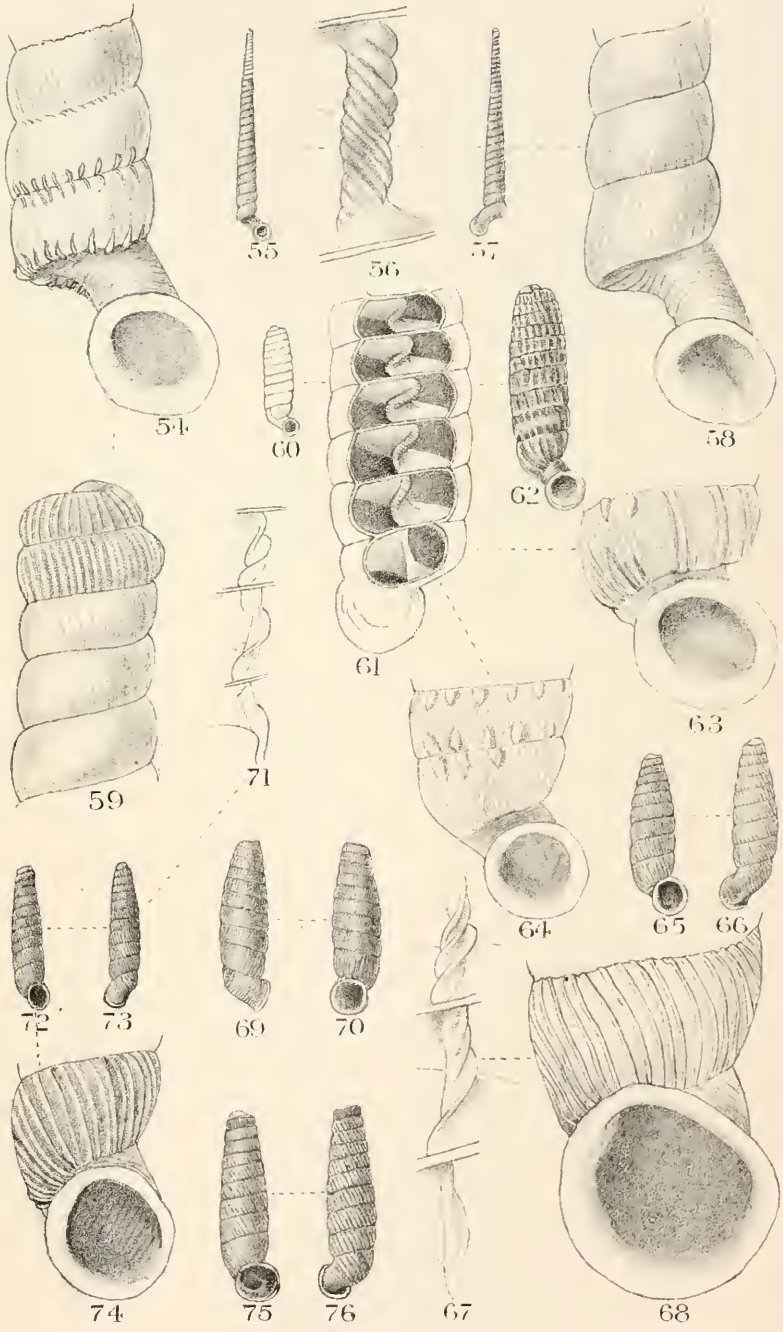
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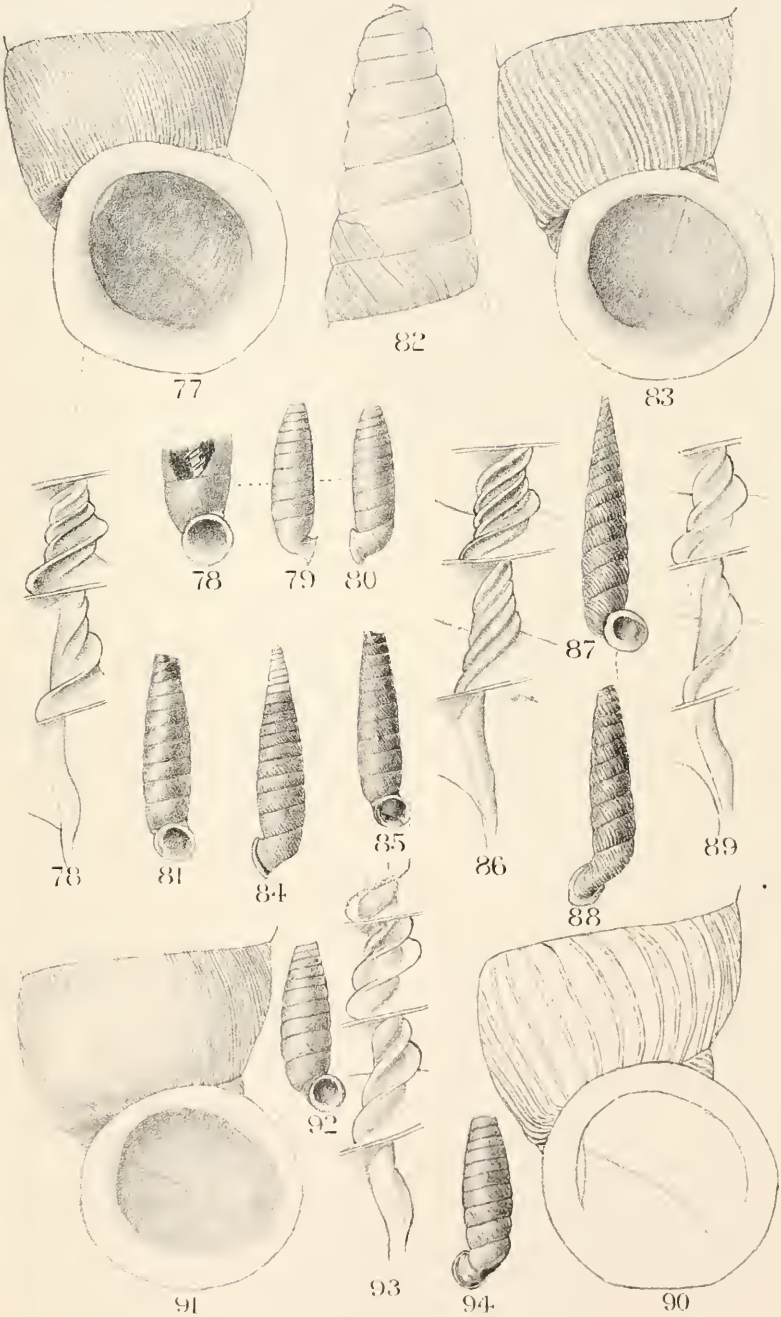
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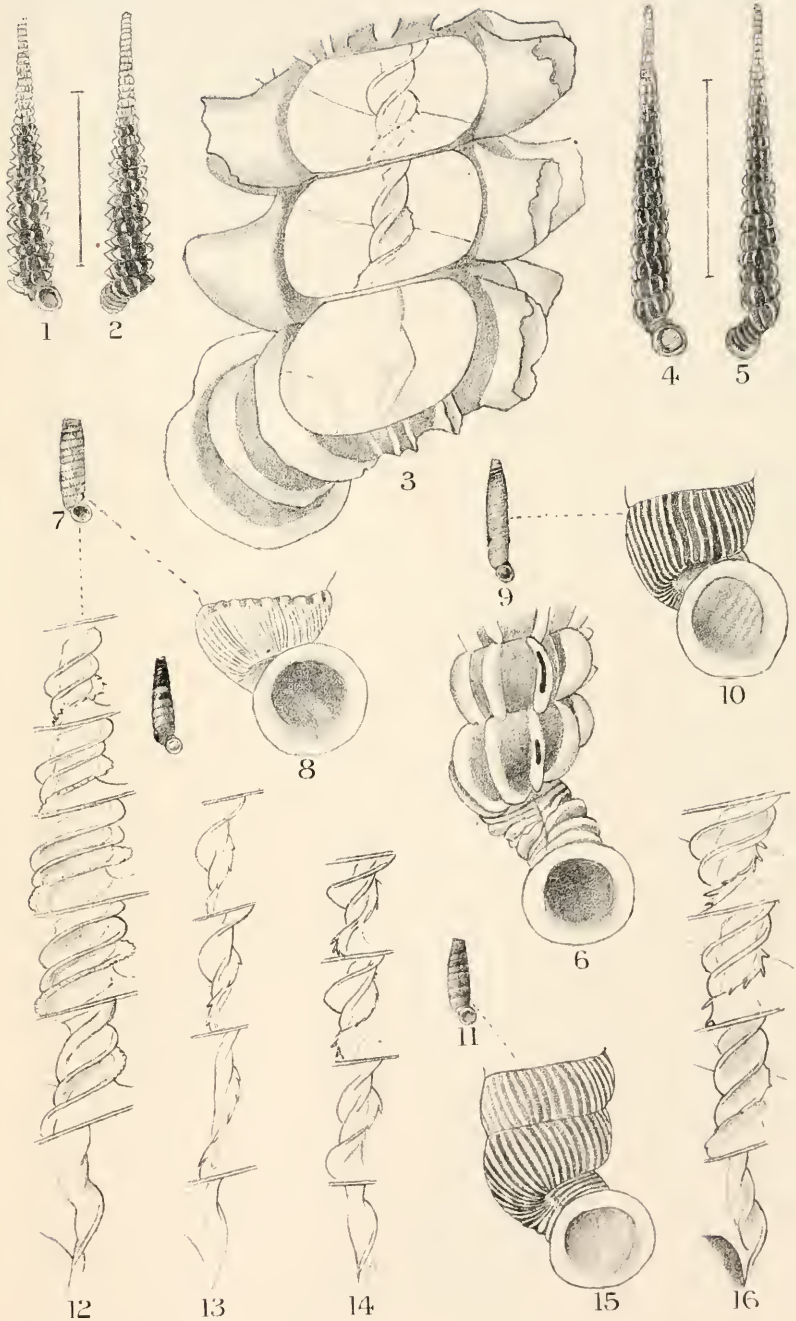
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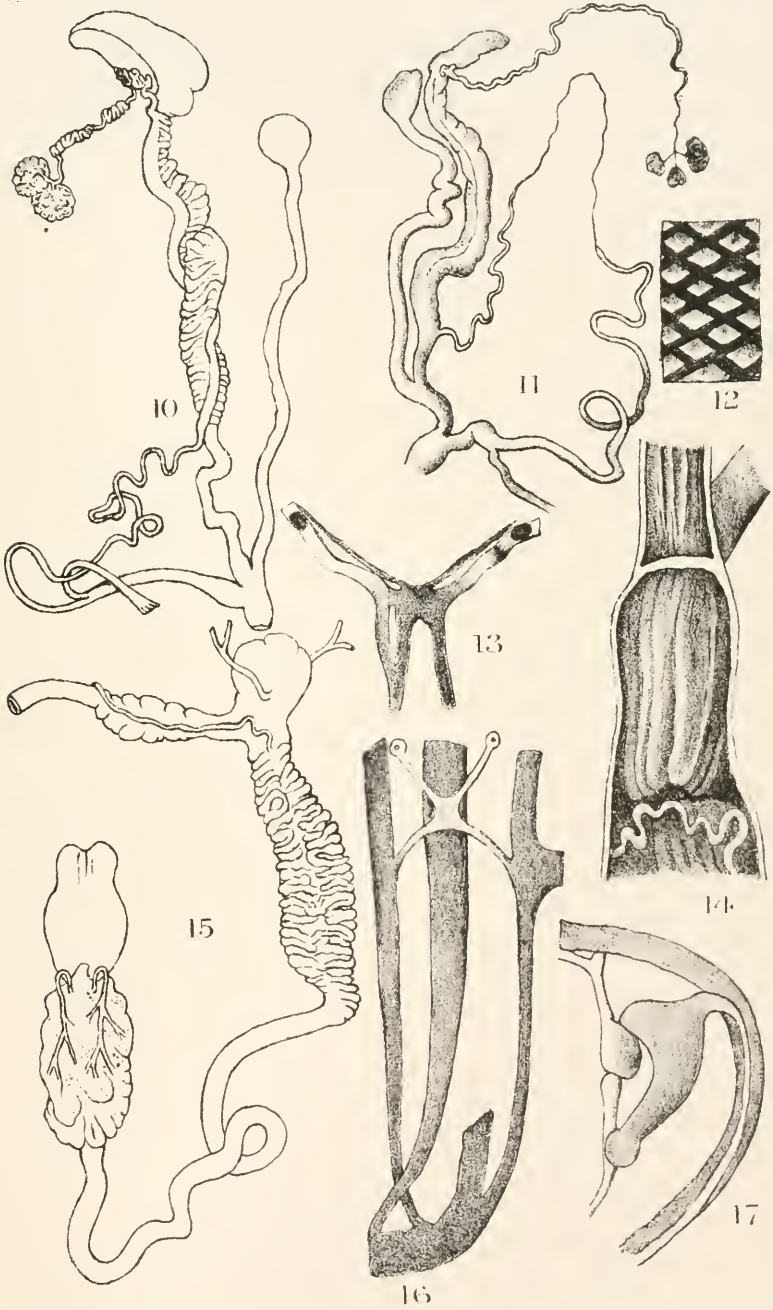
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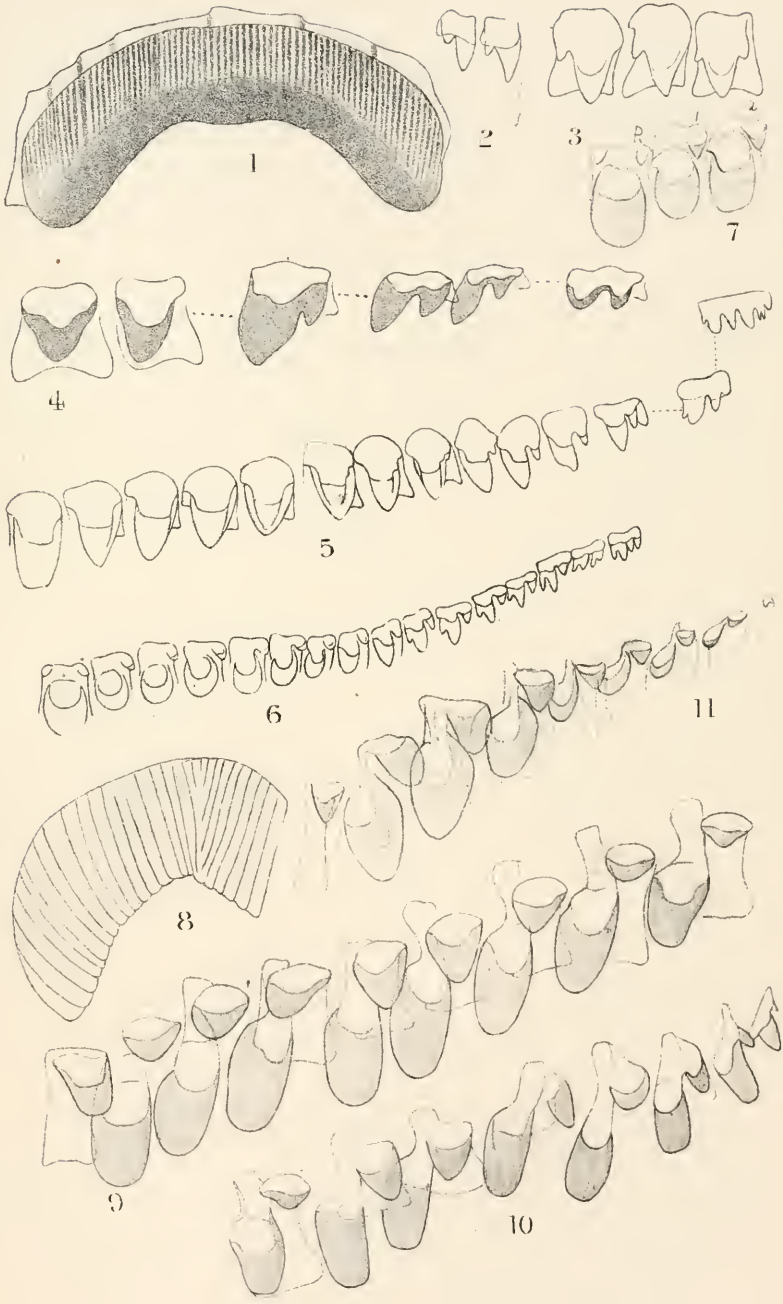
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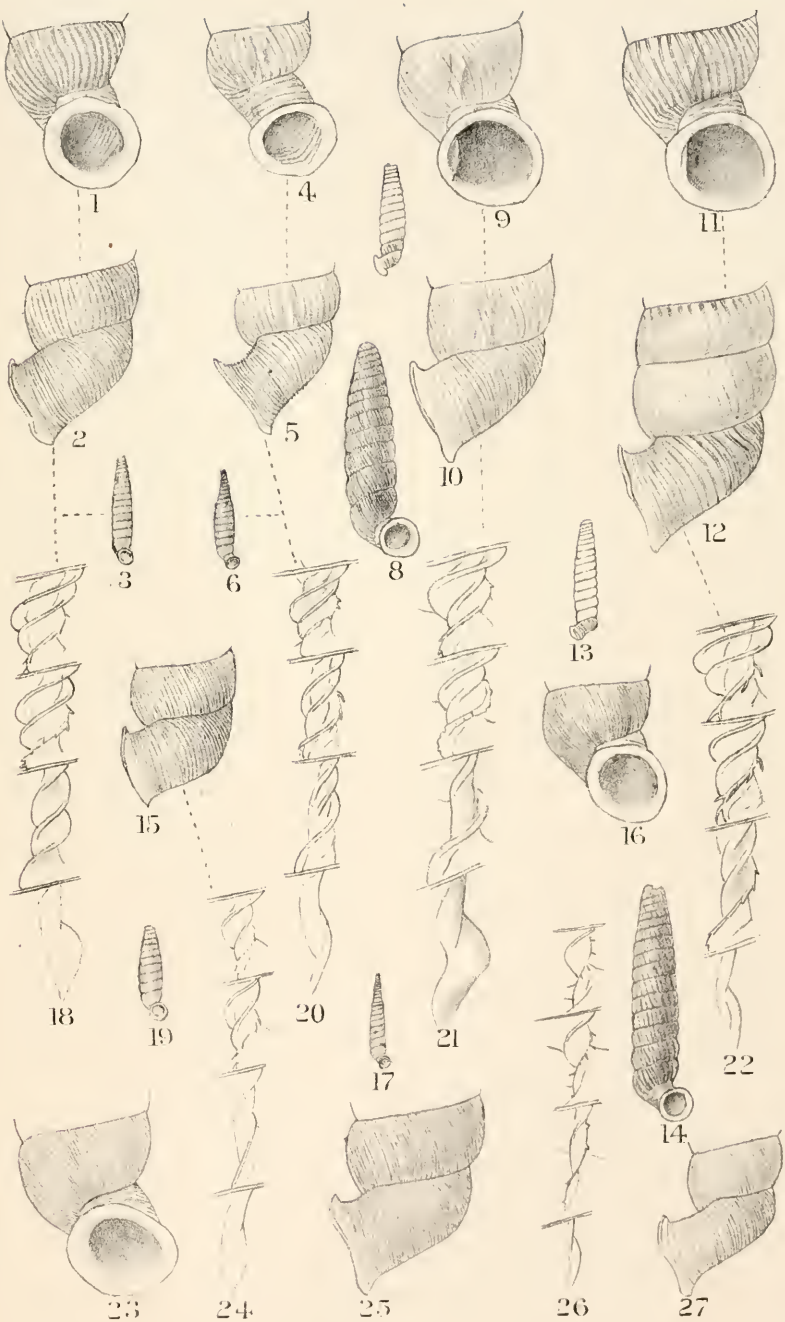
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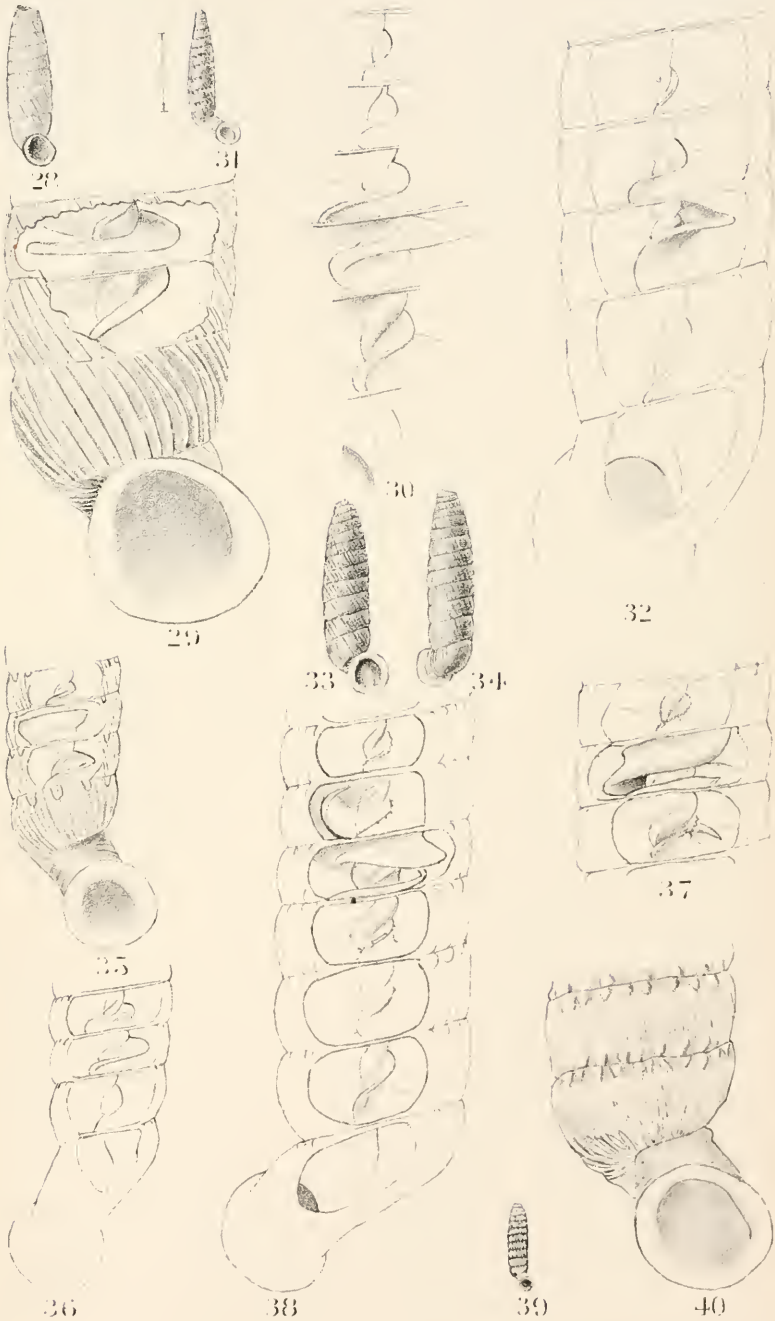
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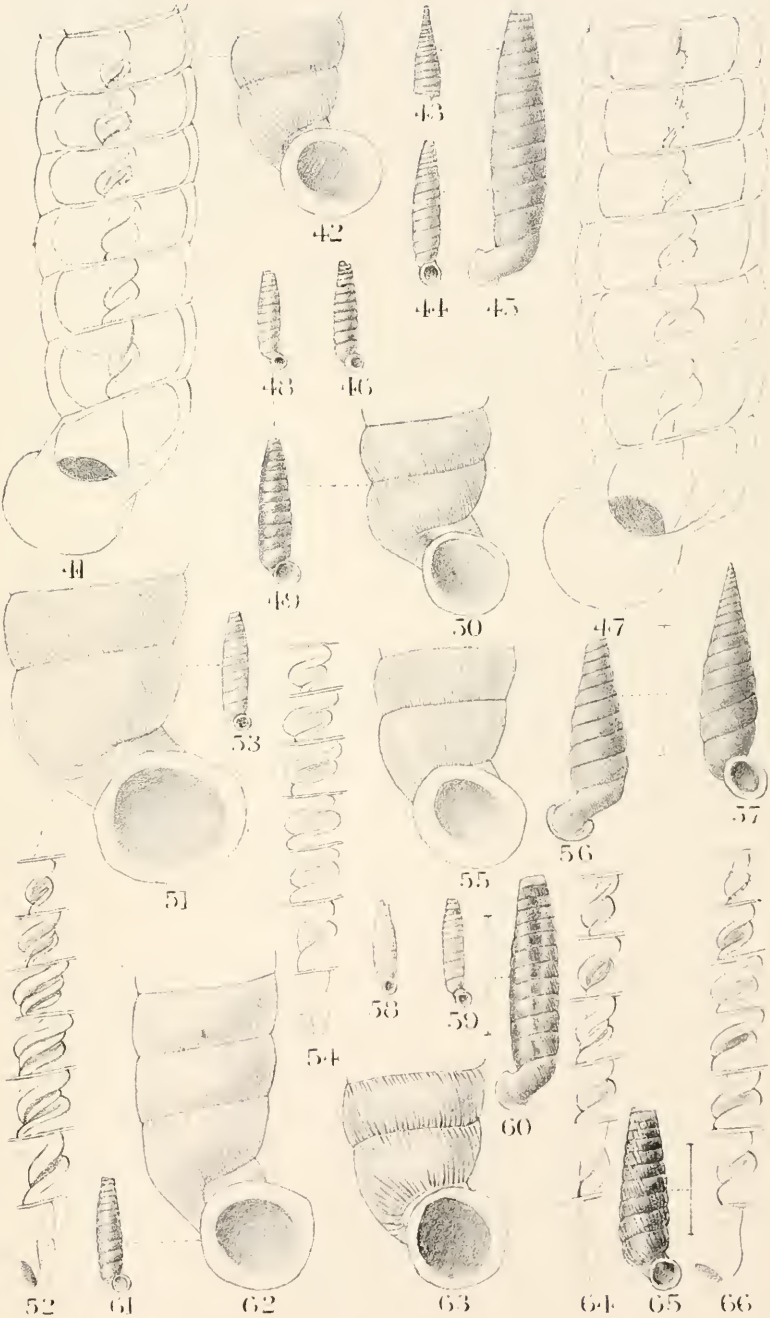
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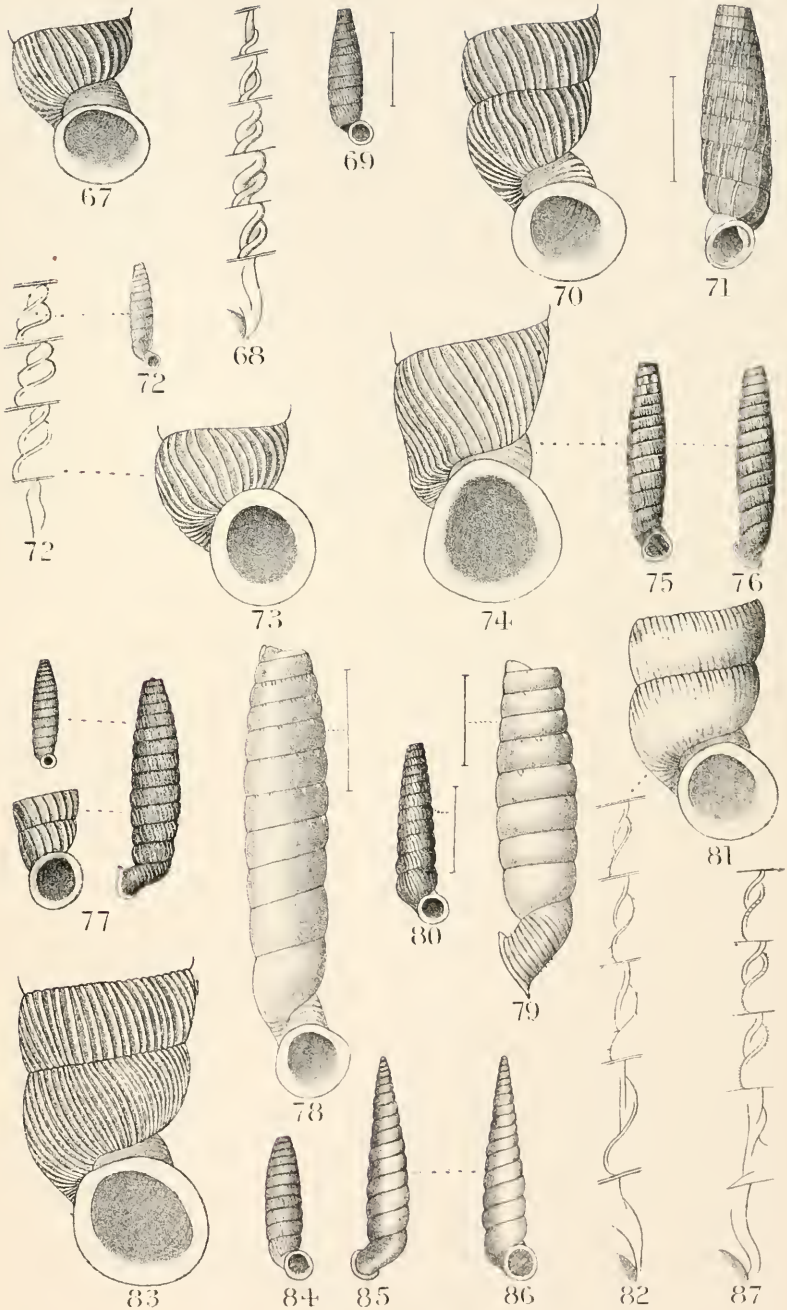
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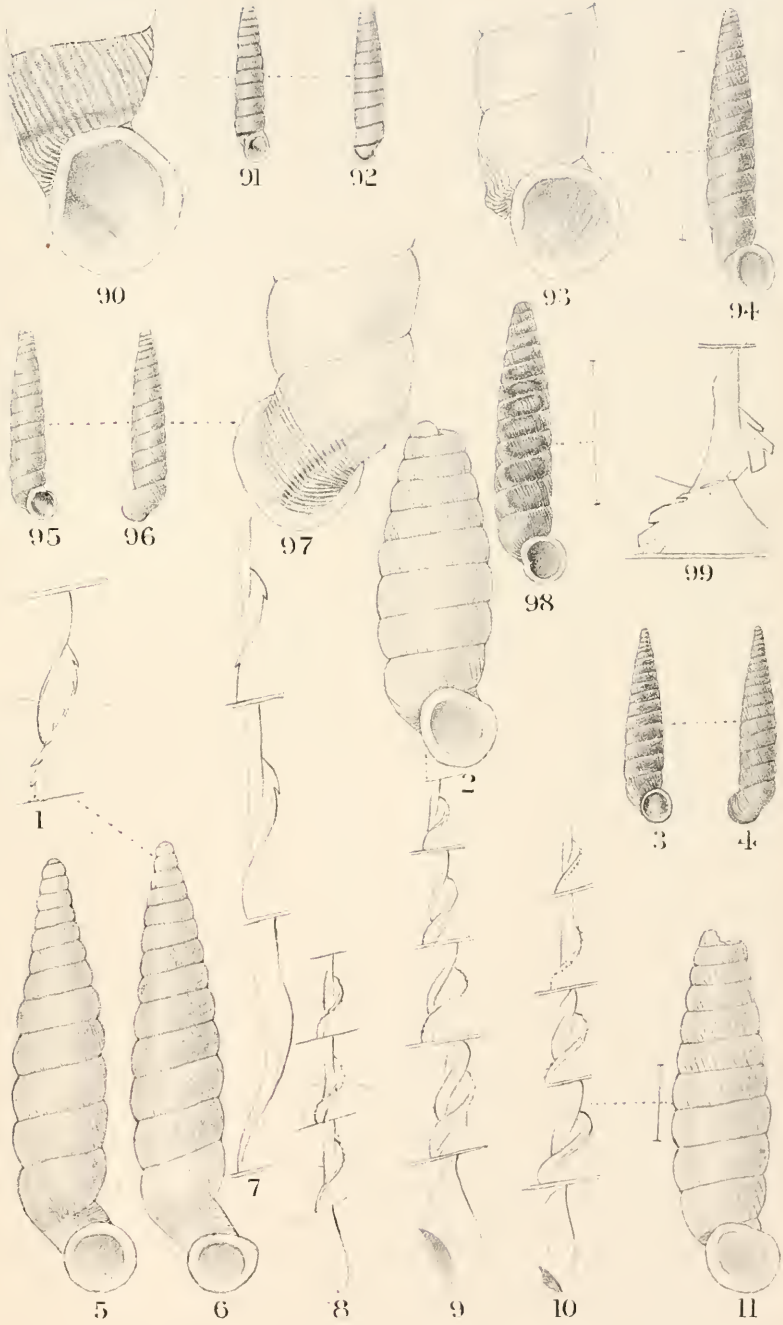
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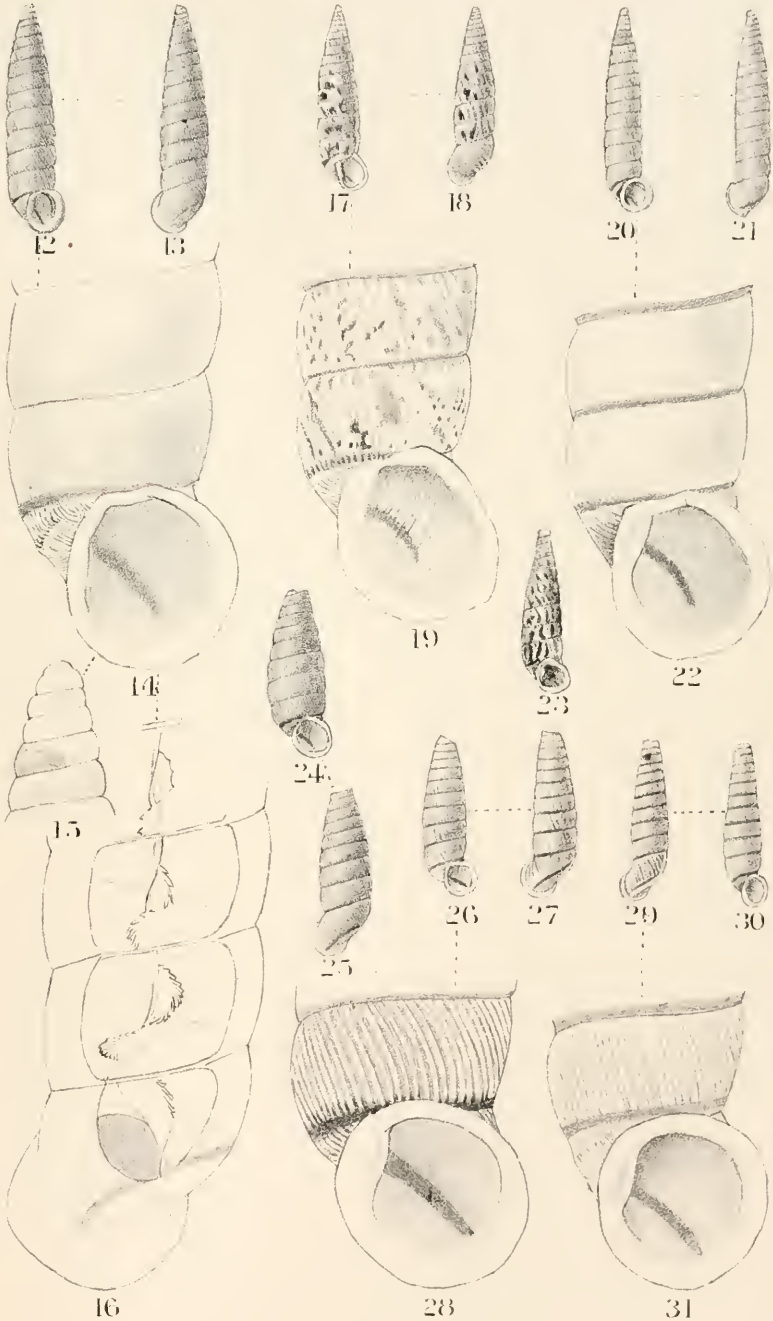
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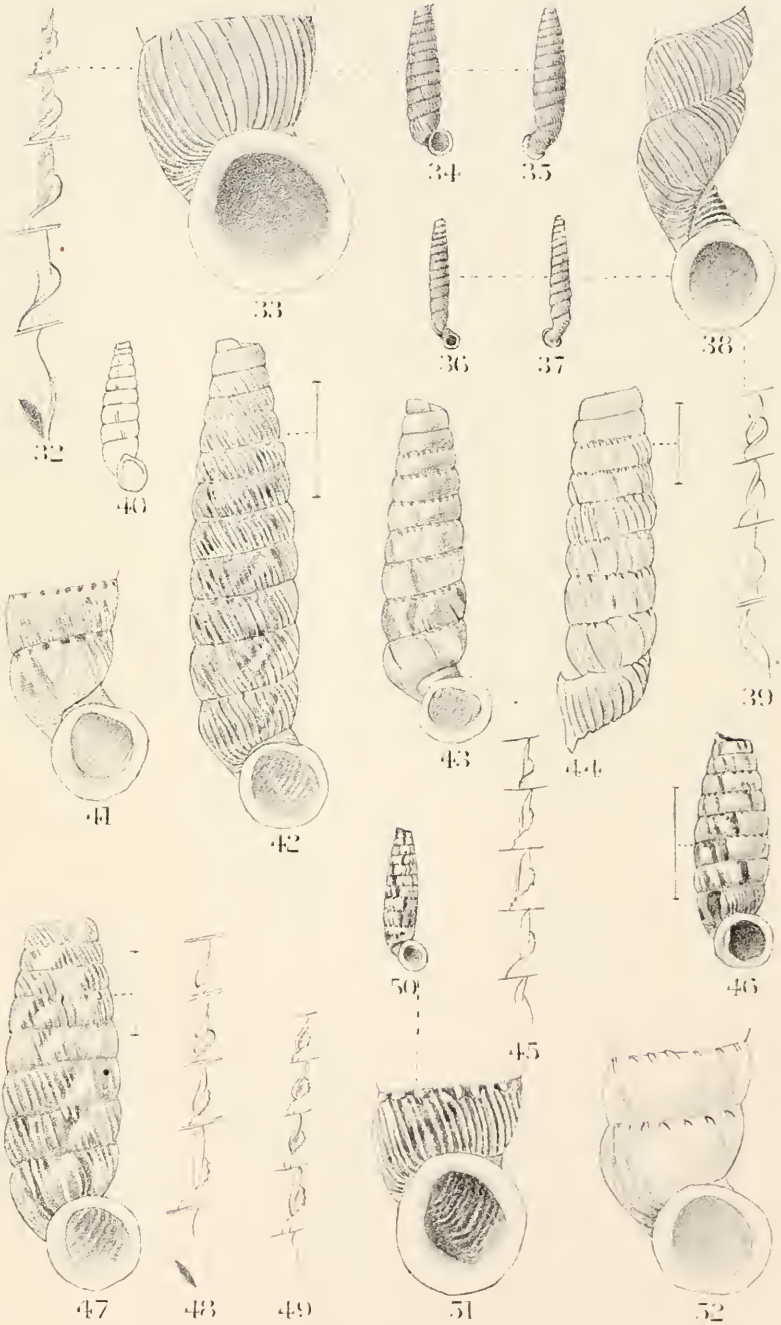
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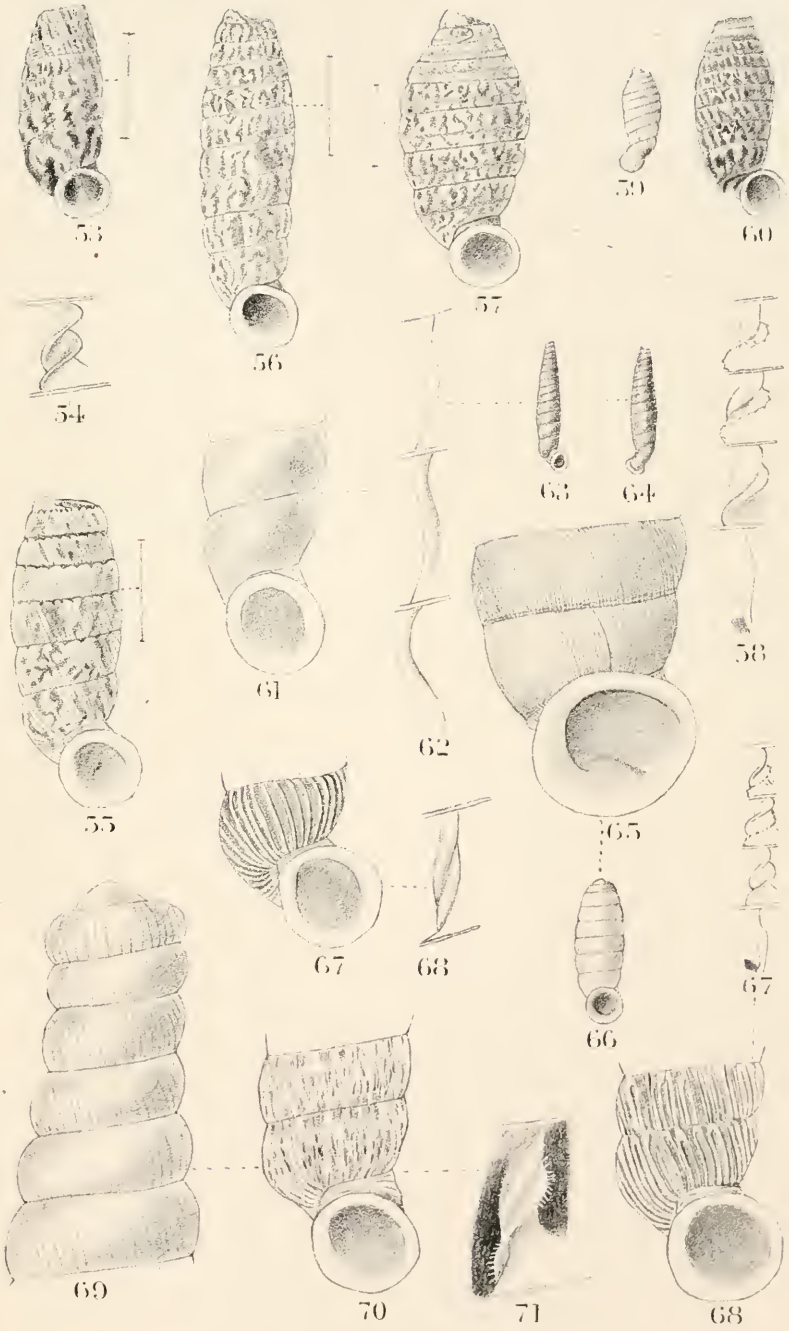
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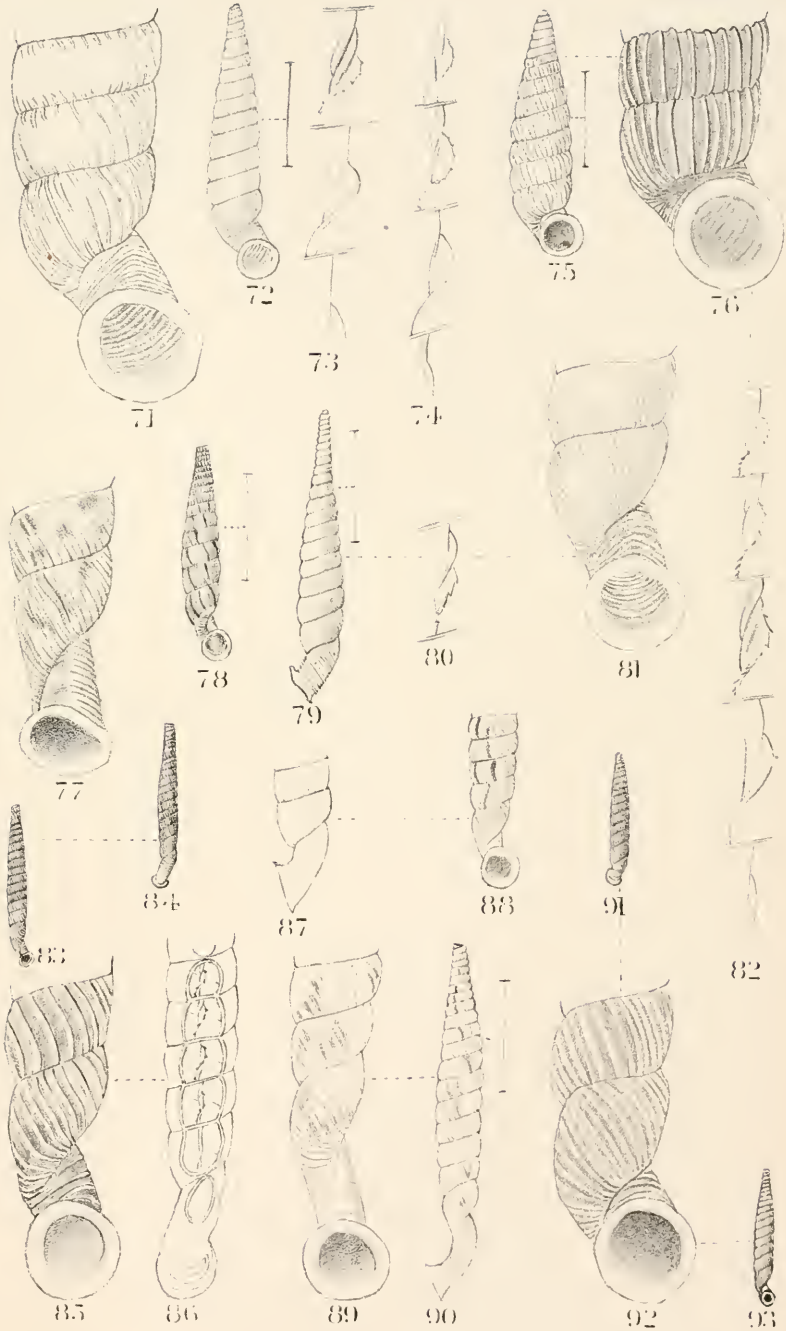
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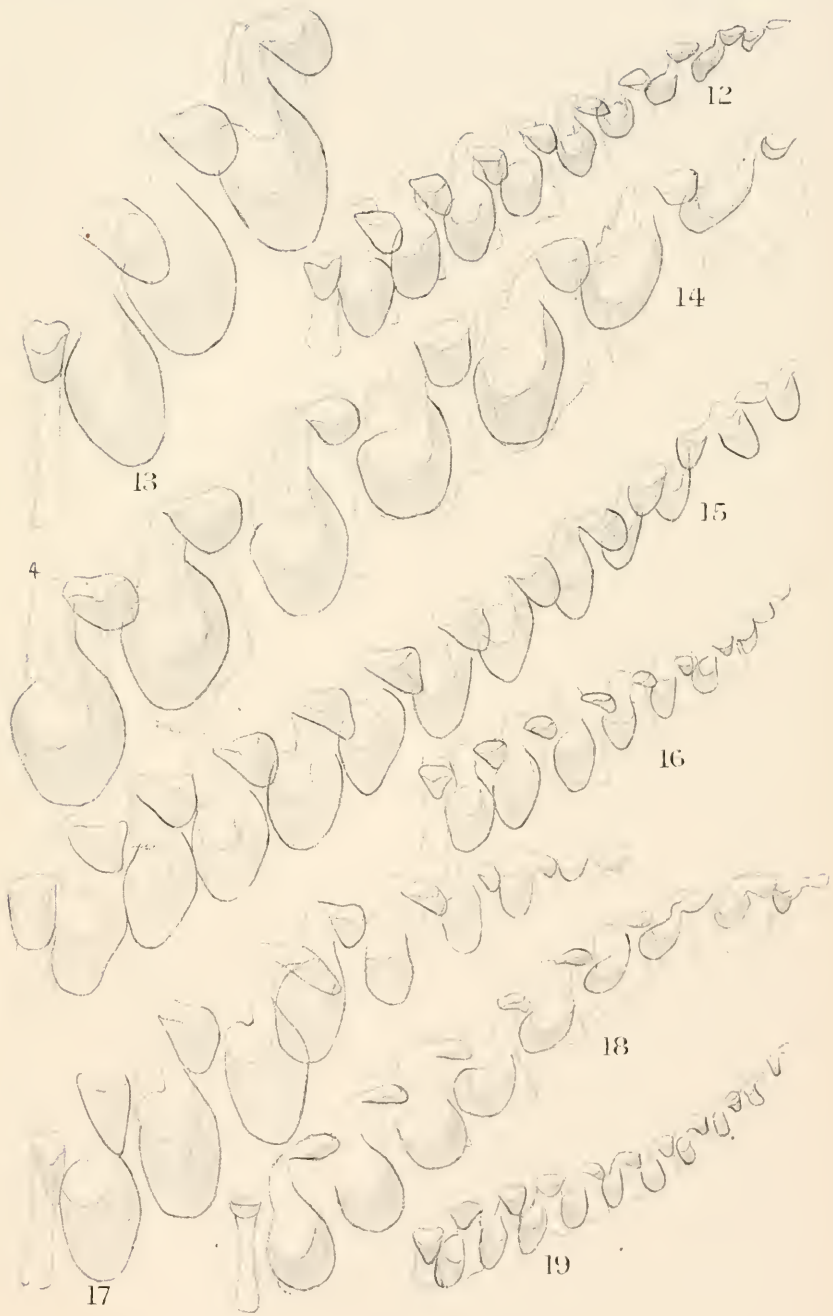
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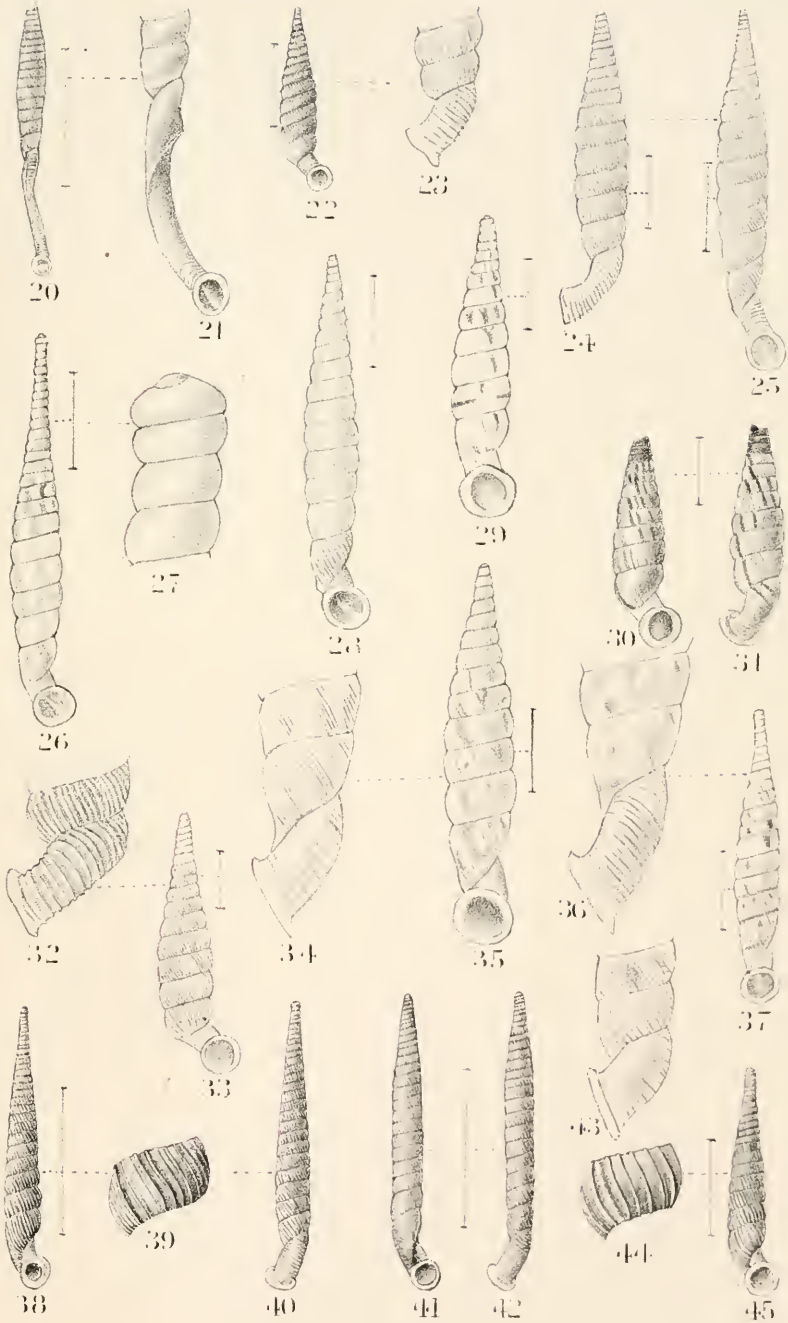
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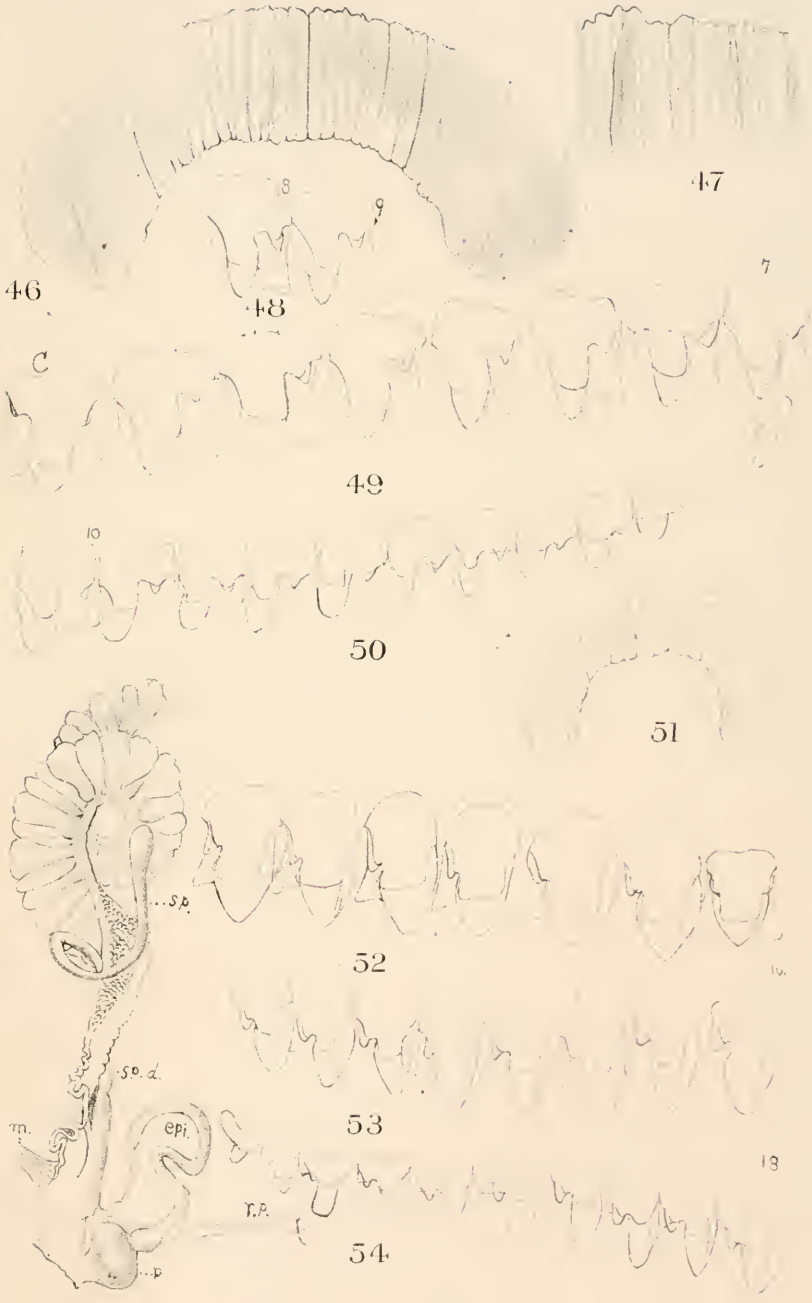
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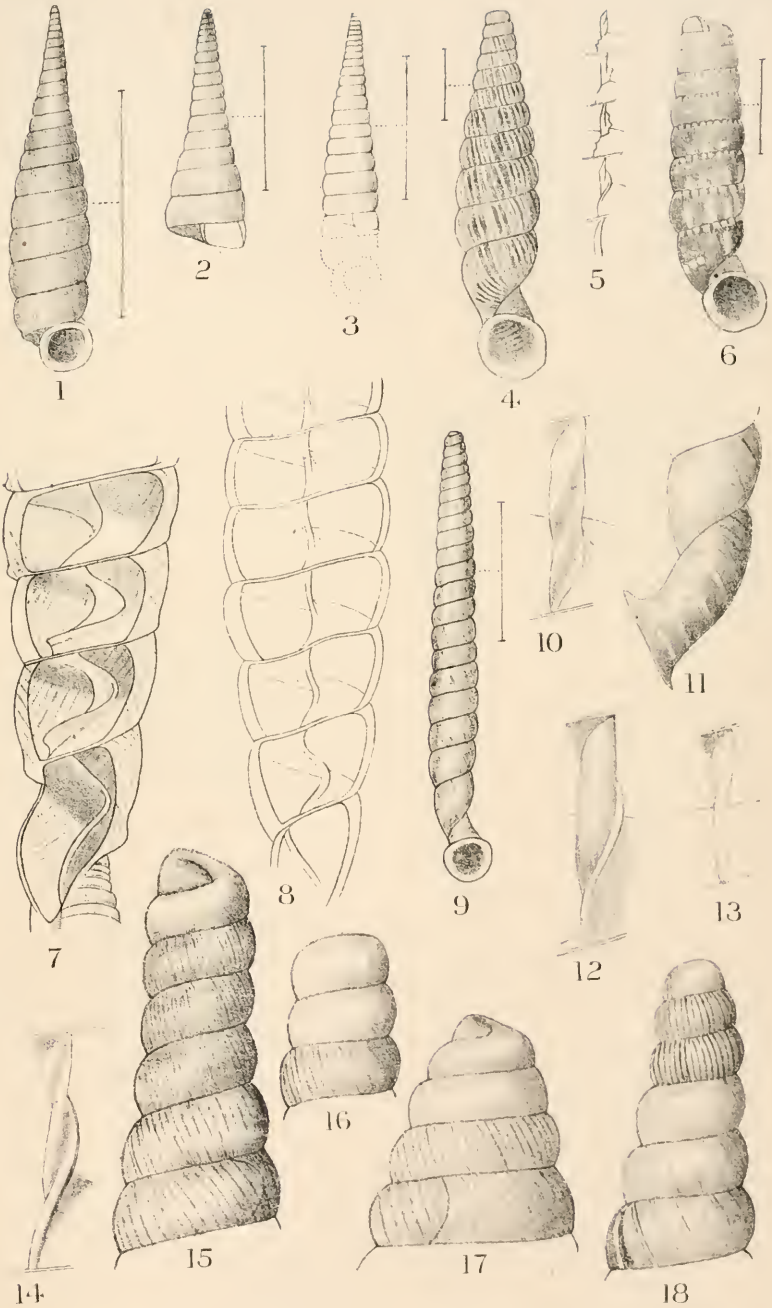
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